The Collected Works of Peter Razzell

An Anthology

Volume 3

An Anthology

Date: May 02, 2026

Table of Contents

Socio-Economic Status and Social Class in Ipswich, 1872-1910 0
Poverty or Disease Environment? The History of Mortality in England, 1500-1900 6
Poverty, Birth Weight and Infant Weight Gain in Hertfordshire, 1923-1939 15
Social Capital and the History of Mortality in Britain 21
The Hazards of Wealth: Adult Mortality in Pre-Twentieth Century England 23
The Sociological Study of Fertility and Mortality in Ipswich, 1872-1882 46
Review of J. Riley, Poverty and Life Expectancy 67
Population and Disease: Transforming English Society, 1550-1850 69
The History of Infant, Child and Adult Mortality in London, 1538-1850 401
The Evaluation of Bedfordshire Burial Registration 423
Living Same-Name Siblings in England, 1439-1851 447
Infant Mortality in London, 1538-1850: a Methodological Study 452
Living Same-Name Siblings and English Historical Demography 472
The Decline of Adult Smallpox in Eighteenth Century London 478
Socio-Economic Status and Adult Mortality in England 500
Rateable Value as a Historical Measure of Socio-Economic Status 507
The Historical Socio-Economic Classification of Occupations 516
Urban Inoculation and the Decline of Smallpox in Eighteenth Century Cities 519
Inoculation and the Decline of Smallpox Mortality in London 533
New Preface to William Shakespeare: the Anatomy of an Enigma 551
Mortality, Marriage and Population Growth in England, 1550-1850 554
Asian Population Growth and the Increase of Socio-Economic Inequality in Britain 689
English Population Growth in the Eighteenth Century 694
Population Growth and the Increase of Socio-Economic Inequality in Britain 719
Malthus: Mortality or Marriage? English Population Growth 732
The Geography of Smallpox in England before Vaccination 772
The Puritan Tradition in Southwold, Suffolk 788
A Sociological Analysis of the English Civil War 791
Max Weber and Environmental Determinism 824
Essays in Historical Sociology 835
Review of Gavin Weightman's The Great Inoculator 1174
Covid 19: Possible Lessons from History 1177
Shakespeare's Biography: a Conundrum Resolved 1178
Population Growth and the Development of Capitalism 1183

Table of Contents

Same-Name Methodology and Parish Registration 1201
The Life of Shakespeare: a Critical Evaluation 1207
The Potential Danger of Monkey Pox 1223
The Origins of the Long Parliament in the English Civil War 1228

Socio-Economic Status and Social Class in Ipswich, 1872-1910.

Peter Razzell

All social scientific work using socio-economic and social class categories faces the problem of how to construct a system of classification. Most historians have either used the method of classifying occupations into social class categories created by Armstrong in his work on nineteenth century York, or have utilised the scheme devised by the Registrar-General at the beginning of the twentieth century. Neither of these schemes is fully comprehensive, with many occupations not included in the classification lists.

Other difficulties are well-known: local and historical variations might make any general scheme of classification inappropriate, and the problem of interpreting the meaning of ambiguous occupational descriptions. For example, in the Ipswich vaccination birth registers two fathers were listed as builders, but one was returned in the census as a builder employing 112 men and 75 boys as well as two domestic servants, the other as a foreman builder without any employees. There is also the problem that the conventional Social Class 3 category normally includes over 50 per cent of all occupations, with only a small minority in Social Class 1 and 2, making statistical analysis difficult.

A scheme of classification was devised for research on the history of mortality and fertility in Ipswich which uses data included in the original source material. The vaccination birth register includes information on whether individual children were vaccinated by the public vaccinator, or were vaccinated by private family doctors. Private vaccination cost something of the order of five shillings per vaccination, a significant sum for most people at the end of the nineteenth century. The basis of the system of classification of occupations is to measure the number of private or public vaccinators used by particular occupational groups for the vaccination of their children, assuming that the ability to pay for private vaccination is a reflection of socio-economic status.

Father's occupations were classified into five categories: 1. Occupations where 0-20% of children's vaccinations were public. 2. 21-40% of public vaccinations. 3. 41-60%. 4. 61-80%. 5. 81-100%. To be meaningful, it was assumed that this classification of occupations required at least fifty individual birth entries. Where there is an overlap in the latter classification and that adopted by the Registrar-General, it is possible to compare social class categories as follows:

Table 1: The Comparison Of Social Class Categories Using The Number Of Public/Private Vaccinations In Ipswich 1871-1901 Versus The Registrar-General's 1911 Classification.

Father's Occupation	*Public Vaccinations*	*Private Vaccinations*	*Total*	*% Public Vaccinations*	*Vaccination Class Category*	*R.G.'s Classification*
Accountant	18	114	132	14%	1	1
Anglican Clergyman	8	52	60	13%	1	1
(Curate, Rector, Vicar)						
Baker	82	166	248	33%	2	2
Blacksmith	389	191	580	67%	4	3
Bootmaker	54	68	122	44%	3	3
Bricklayer	483	238	721	67%	4	3
Brickmaker	181	36	217	84%	5	5
Builder	7	75	82	9%	1	1
Butcher	61	103	164	37%	2	2
Cab Driver	93	34	127	73%	4	5
Carpenter	536	649	1185	45%	3	3
Chemist/Chymist	9	46	55	16%	1	1
Coachman (Domestic)	96	116	222	43%	3	4

Commercial Clerk	80	145	225	36%	2	1
Commercial Traveller	49	237	286	17%	1	1
Currier	44	27	71	62%	4	4
Draper's Assistant	6	50	56	11%	1	1
Engineer	17	40	57	30%	2	2
Fishmonger	33	48	81	41%	3	2
Gardener (Domestic)	135	141	276	49%	3	4
Gas Fitter	27	30	57	47%	3	3
Greengrocer	35	51	86	41%	3	2
Grocer	39	206	245	16%	1	2
Groom	49	35	84	58%	3	5
Hairdresser	15	67	82	18%	1	3
Hawker	42	8	50	84%	5	5
Innkeeper	11	60	71	15%	1	2
Labourer (Bricklayer's)	427	104	531	80%	5	5
Labourer (Builder's)	249	67	316	79%	4	5
Labourer (Docks)	73	19	90	81%	5	5
Labourer (Foundry)	1539	499	2038	76%	4	5
Labourer (General)	451	124	575	78%	4	5
Miller	38	41	79	48%	3	4
Painter	148	83	231	64%	4	3
Plumber	53	84	137	39%	2	3
Police Constable	86	135	221	39%	2	4
Postman	53	41	94	56%	3	4
Printer	37	61	98	37%	2	3
Private (Army)	56	35	91	62%	4	4
Railway Clerk	36	69	105	34%	2	1
Railway Engine Driver	31	51	82	38%	2	3
Railway Guard	78	90	168	46%	3	3
Railway Platelayer	33	17	50	66%	4	5
Railway Signalman	48	36	84	57%	3	3
Sawyer	67	31	98	68%	4	4
Schoolmaster	5	83	88	6%	1	1
Shipwright	93	57	150	62%	4	3
Solicitor	5	70	75	7%	1	1
Solicitor's Clerk	6	62	68	9%	1	1
Tailor	171	171	342	50%	3	3
Upholsterer	21	51	72	29%	2	3
Wheelwright	47	40	87	54%	3	3

There is an overall similarity in the two systems of classification, although there are a number of anomalies. The majority of discrepancies in classification are of the magnitude of a single category and are the result of marginal differences in the proportions of public/private vaccinations – coachmen, fishmongers, greengrocers, labourers (builder's, foundry, general), plumbers, railway engine driver and shipwrights – and many are probably linked to small sample sizes. The only occupations with a discrepancy of two categories – grooms, hairdressers and police constables – also have relatively small sample sizes, and are on the margins of category classification.

The advantage of the dataset on individual families is that it allows detailed exploration of potential anomalies. For example, the Registrar-General classified all clerks as social class 1, yet there were variations in public/private categorisation depending on the type of clerk: Commercial Clerks – Class 2; Iron-founders' Clerks – Class 1; Merchants' Clerks

– Class 1; Post Office Clerks – Class 2; Railway Clerks – Class 2; Solicitors' Clerks – Class 1. The overall classification of all clerks using the number of public/private vaccinations is Social Class 1, the same as that adopted by the Registrar-General in 1911, although clerks were subsequently relegated to Social Class 2 and Social Class 3 in later censuses.

In order to further clarify the classification of occupations, information was collected on the presence of domestic servants – a measure of socio-economic status used by contemporaries such as Seebohm Rowntree – in Social Class 1 families enumerated in the 1881 Ipswich census. Although the numbers are small, the following table gives some indication of the relative prosperity of the most important occupational groups in social class 1, as measured by their ability to employ domestic servants:

Table 2: Proportions of Families Employing Domestic Servants by Social Class, Ipswich 1871-1881.

Occupation Of Household Head	*Proportion Of Families With Domestic Servants*	*Number of Families*
Professionals (Clergymen, Doctors, Solicitors, Architects, Surveyors & Navy Officers)	95%	38
Merchants & Bankers	90%	29
Accountants	70%	23
Drapers	69%	32
Clerks	58%	91
Grocers	52%	50
Innkeepers/Publicans	46%	35
Commercial Travellers	26%	31

The large percentage of professional and merchant families employing domestic servants is not surprising, but the high proportion amongst drapers, clerks and grocers is less expected. Many clerks were described in the vaccination registers and census schedules as accountants, perhaps in part explaining their relatively high socio-economic status.

Ideally we would want to explore the relationship between all occupations and employment of domestic servants, particularly in Social Class 2. Limited data is available for a sample of children born in Ipswich in the 1870s. Of 404 Social Class 1 families found in the 1881 census, 224 – 55% – had domestic servants, compared to 2% – 3 out of 125 – in the non-Social Class 1 families. A special study was also carried out on the families of bakers and butchers who might be expected to have had a measure of prosperity, but the percentage of bakers' families employing servants was only 19% – 11 out of 59 – and butchers 18% – 8 of 45. The difference in the employment of domestic servants by commercial travellers in Social Class 1 (26%) and bakers in Social Class 2 (19%) and butchers in Social Class 3 (18%) was therefore very marginal, but to some extent this is what we would expect with some occupational groups on the margins of social class classification.

Further clarification of the categorisation of social classes can be established through data on rateable value of birth addresses.

Table 3: Social Class and Rateable Value Of Birth Addresses, Ipswich 1871-1881.

Vaccination Social Class	*Mean Rateable Value (£)*	*Number*
1	22.2	141
2	14.0	172
3	9.0	255
4	6.7	223
5	5.9	140

There is a linear trend of decreasing rateable values by social class, reducing from £22.2 in social class 1 to £5.9 in social class 5, confirming the general validity of the class classification. The mean rateable value of houses lived in by Social Class 1 families employing domestic servants was £30.6, compared to £14.1 for Social Class 1 families not employing servants, suggesting that a further sub-division of the social class gradient is valid.

There is a similar linear gradient between rateable value and the percentage of private doctors used by families for purposes of vaccination: 16.2% of £2.75-£3.75 rateable value families used private doctors, compared to 86.6% of those living at addresses with rateable values in the £40-£175 band, and the percentages of private doctors ran evenly between these two extremes as rateable values increased. It therefore appears that there is an interlocking relationship between rateable value, the use of private/ public doctors, the employment of domestic servants, and occupations of head of household, providing the basis for a comprehensive system of classification of socio-economic status.

In order to illustrate the analytical possibilities of the Ipswich data, a detailed analysis was carried out on the two samples drawn from the 1871 and 1891 censuses, one employing domestic servants – which we have termed elite families – with those headed by labourers, a well-defined group known to have been one of the poorest and least educated in late nineteenth century England. The elite group were sub-divided into two categories: 1. Families with two or more resident domestic servants (SEG1). 2. Families with only one domestic servant (SEG2). To give some idea of the nature of these categories, we list below the main occupations followed by the elite male heads of household enumerated in the two censuses combined.

Table 4: Occupations Of Head Of Households In SEG1 And SEG2 Families, 1871 and 1891 Ipswich Samples.

SEG1 Occupations	*Number Of Cases*
Attorney & Solicitor	10
Doctors & Surgeons	13
Hotel/ Innkeepers	13
Manufacturers	8
Merchants	23
Others	62
Total	132
SEG2 Occupations	*Number Of Cases*
Attorney & Solicitor	5
Baker & Confectioner	8
Builders	6
Butchers	16
Clerks	31
Commercial Travellers	19
Drapers & Tailors	19
Grocers	10
Independent/ Property Owners	6
Manufacturers	17
Merchants	16
Musicians/Piano Tuners	5
Printers	6
Others	180
Total	344

Socio-Economic Group 1 (SEG1) was mainly made up of professionals and business occupations, whereas although Group 2 (SEG2) included some of these occupations, it was mainly made up of clerks, commercial travellers, artisans and tradesmen. SEG1 appears to have been significantly more stable in its status characteristics than SEG2, as revealed in the following table.

Table 5: Continuities in the Employment of Servants in Families, Ipswich 1871 And 1891 Samples.

SEG 1 Families 1871				*SEG 2 Families 1871*			
No Servants In 1881	1 Servant In 1881	2+ Servants In 1881	Total	No Servants In 1881	1 Servant In 1881	2+ Servants In 1881	Total
5 (7%)	13 (17%)	57 (76%)	75	73 (42%)	80 (47%)	19 (11%)	172
SEG 1 Families In 1891				*SEG 2 Families In 1891*			
No Servants In 1901	1 Servant In 1901	2+ Servants In 1901	Total	No Servants In 1901	1 Servant In 1901	2+ Servants In 1901	Total
6 (11%)	16 (28%)	35 (61%)	57	96 (56%)	61 (36%)	15 (9%)	172

Only between 7 and 11 per cent of SEG1 families had no servants ten years after they were initially enumerated, whereas the equivalent figure for SEG2 families was 42 to 56 per cent. Many of the SEG2 families without servants in subsequent censuses appear to have been artisans and tradesmen rather than professional or business people, suggesting that a more refined classification of socio-economic status will be possible in future by combining information on servants at different stages in the life cycle.

Although there were differences in the continuity of employment of servants between SEG1 and SEG2, they appear to have shared rather than differed in other socio-economic characteristics. It was seen earlier that employment of public/ private vaccinators was linked to social class, as well as other measures such as rateable value. The following table analyses the use of public/private vaccinators in elite compared to labourers' families in the 1871 sample, with the latter divided between non-agricultural labourers (SEG3) and agricultural labourers (SEG4).

Table 7: Private/ Public Vaccinators Used By Families 1871-81 Analysed By Socio-Economic Group

Socio-Economic Group	All Vaccinations Private	Mixed Private/ Public Vaccinations	All Vaccinations Public	Total Number Of Families
SEG1	21 (78%)	2 (7%)	4(15%)	27
SEG2	58 (78%)	8 (11%)	8 (11%)	74
SEG3	6 (8%)	9 (12%)	62 (81%)	77
SEG4	1 (6%)	1 (6%)	14 (88%)	16
SEG1 &2	79 (78%)	10 (10%)	12 (12%)	103
SEG3 & 4	7 (8%)	10 (11%)	76 (85%)	89

Although the numbers are small, the table indicates that SEG1 and SEG2 both employed the same number of private doctors for the vaccination of their children – 78 per cent – compared to the 8 to 6 per cent used by SEG 3 and SEG4.

Finally, a fragment of evidence on living in the local workhouse ten years after first census enumeration, illustrates the poverty of labourers' families compared to those employing domestic servants: none of the latter group finished up as paupers, whereas six husbands and wives of labourers from the 1871 sample suffered that fate, and four from the 1891 sample experienced a similar fall into absolute poverty.

Disease or Poverty? The History of Mortality in England, 1500-1900.

There has been a long debate on the role of poverty in shaping mortality levels in England, but there is increasing evidence that disease patterns played a much more significant role in population growth than wealth or poverty.

This can be illustrated by the mortality of the royal family in the sixteenth and seventeenth centuries.

Table 1: Mortality amongst the British Royal Family (Sons andDaughters of Kings and Queens), 1500-1899.[1]

		Period	
		1500-1699	*1700-1899*
Number ofStillbirths		31	5
Number of Live Births		57	43
Proportion of Live Children Who Had DiedBy			
	One Day	15.8%	4.7%
	One Month	22.8%	4.7%
	One Year	45.6%	9.4%
	Five Years	63.1%	14.1%
	Fifteen Years	63.1%	14.1%
	Fifty Years	85.9%	35.0%

Infant and child mortality was extremely high before 1700: 63 per cent of all royal children died under the age of five, and this was accompanied by a large number of stillbirths. Mortality by five years of age fell dramatically after 1500-1699, reducing to 14 per cent by 1700-1899, and accompanied by a reduction in the number of stillbirths. Although the royal family was probably the wealthiest family in England, the state of personal and public hygiene amongst royalty in earlier period was highly deficient. For example, 'it is known on medical advice the King [Henry VIII] took medicinal herbal baths each winter, and also avoided baths when the sweating sickness was about. This avoidance possibly reflected a school of thought that rated bathing as a dangerous activity which "allowed the venomous airs to enter and destroyeth the lively spirits in man and enfeebleth the body."'[2]

High stillbirth and maternity mortality were probably due to poor hygiene and inadequate midwifery practices:

> If the membrane bag of fluid in which the baby had developedhad not been broken by the time the midwife arrived, she wouldput her hand up the mother's vagina and break the membrane with a specially sharpened fingernail, or a sharp-ended thimble … In 1687 a midwife estimated that two-thirds of miscarriages, stillbirths and maternal deaths in childbed were due to colleagues.[3]

It was impossible for the royal family to avoid infection as the court was the centre of great numbers of people attending regularly, encouraged by the practice of the monarch touching supplicants for the cure of "king's evil", a form of scrofula.[4] It was not just individual behaviour which was responsible for these health hazards, but also the condition of the

[1] P. Razzell, *Population and Disease: Transforming English Society, 1550-1850* (2007), p. 91.
[2] Ibid, p. 149.
[3] Ibid, p. 164.
[4] For a discussion of this and other issues on the lack of public hygiene in royal palaces see Ibid, pp. 151-156.

overall palace environment. One account described how 'the floors of the royal apartments [of Westminster Palace] in 1500 were still being strewn with rushes and sweetherbs that were changed daily, like sawdust in a butcher's shop … Dogs and beggars roamed the courtyards living on the scraps that fell from the royal table …'[5] These conditions were not confined to royal palaces, for as Erasmus described in 1517, 'the floors [of houses] are generally spread with clay and rushes from some marsh, which are renewed from time to time but so as to leave a basic layer, sometimes for twenty years, under which fester spittle, vomit, dogs' urine and men's too, dregs of beer and cast-off bits of fish, and other unspeakable kinds of filth.'[6]

Poor public and domestic hygiene continued well into the seventeenth century and beyond. The statutes regulating the streets of London which were still in operation in 1720, included the following:

> No Man shall cast any Urine-Boles, or Ordure-Boles into theStreets by Day or Night, afore the Hour of nine in the Night; And also he shall not cast it out, but bring it down, and lay it in the Canel, under pain of three Shillings and four pence. And if he do cast it upon any Persons Head, the Person to have a lawful Recompence, if he have hurt thereby.[7]

The diary of Samuel Pepys provides additional detail of the state of domestic hygiene. His main water supply was from a pump located in a yard shared with his neighbours, and his waste was discharged into a vault located in his cellar, which he also shared with his neighbours. In the first year of the diary, the following event occurred:

> This morning one came to me to advise with me where to make me a window into my cellar in lieu of one that Sir W. Batten has stopped up; and going down into my cellar to look, I put my foot into a great heap of turds, by which I find that Mr Turner's houseof office is full and comes into my cellar, which doth trouble me; but I will have it helped.[8]

On one occasion he kept a pet eagle in his latrine, but was glad to get rid of it, 'she fouling our house of office mightily.'[9] The result of this very poor personal hygiene was an infestation of lice and fleas. Pepys noted on one occasion that 'I have itched mightily these six or seven days … having found in my head and body above 20 lice, little and great.'[10] When he shared a bed in Portsmouth with Dr Timothy Clarke, physician to the King's household, 'we lay very well and merrily. In the morning concluding him to be the eldest blood and house of the Clerkes, because all the Fleas came to him and not to me.'[11]

These conditions and practices inevitably led to a high incidence of disease and levels of mortality, in spite of the wealth of these privileged populations. There is now evidence that mortality levels of the wealthy were very high in the earlier period, but changed significantly during the eighteenth century. Perhaps the best illustration of this is the changing life expectancy of Members of Parliament during this period. The data is of a very high quality, with about 95 per cent of information on birth and death dates during the period 1660-1820.[12] Members of Parliament came from all areas of the country, and their socio-economic status as owners of estates did not change during the period covered by the

[5] Ibid, p. 150.
[6] Ibid.
[7] Ibid, p. 158.
[8] Ibid, p. 159.
[9] Ibid, p. 160.
[10] Ibid, p. 163.
[11] Ibid, pp. 163, 164.
[12] See the online History of Parliament website.

following table.[13]

Table 2: Mean Number of Years Lived by Members of Parliament, 1660-1820 (Number of Cases in Brackets).[14]

Period of First Entry	*Age at First Entry*		
	29 Years and Under	*30-39 Years*	*40 Years Plus*
1660-1690	25.7 (429)	22.6 (458)	17.9 (633)
1691-1714	28.1 (520)	25.4 (402)	18.3 (438)
1715-1754	30.8 (541)	28.2 (422)	18.5 (347)
1755-1789	37.1 (480)	29.9 (354)	21.2 (431)
1790-1820	38.1 (571)	32.0 (432)	22.4 (572)

All age groups experienced mortality reductions, but the greatest mortality gains were amongst the youngest age cohort aged 29 and under. There was an increase in life expectancy of over 12 years in this group, distributed evenly in the entry period between 1660 and 1789. There were also substantial gains in the 30-39 age cohort – of about 10 years – but these were mainly confined to the entry period between 1660 and 1754. There was a modest increase in life expectancy of nearly 5 years in the oldest 40+ group, which was fairly evenly spread between 1660 and 1820.

Similar patterns are found in the aristocracy and other wealthy classes, along with reductions in adult mortality amongst all socio-economic groups and in all areas of the country.[15] This suggests that there was an autonomous reduction of disease incidence during the eighteenth century.[16]

The pattern of infant and child mortality was somewhat different. These forms of mortality did not reduce until the middle of the eighteenth century, and the falls in mortality appear to have occurred in some areas first amongst the wealthy.

Table 3: Infant and Child (1-4) Mortality (Per 1,000) amongst Elite and Control Families in Seventeen Rural Parishes, 1650-1799.[17]

Period	Elite Families		Control Families	
	Infant Mortality	Child Mortality	Infant Mortality	Child Mortality
1650-99	158	143	180	132
1700-49	177	106	223	146
1750-99	113	69	159	134

An elite family – gentlemen, professionals and merchants – was matched with the next control family in the baptism register, most of whom were artisans and labourers. There was little difference between the two groups in the late seventeenth century, but a sharp divergence thereafter, particularly in child mortality rates. Other sources indicate a variation in findings, although overall it would appear that these forms of early mortality reduced first amongst wealthy families and only later amongst the general population in the eighteenth century.[18]

[13] Ibid.
[14] P. Razzell, *Essays in Historical Sociology*, 2021, p. 169.
[15] P. Razzell, *Mortality, Marriage and Population Growth in England, 1550-1850*, 2016, pp. 43-56.
[16] See J.D. Chambers, *Population, Economy, and Society in Pre-Industrial England*, 1972, pp. 82, 87.
[17] Source: Razzell, *Mortality*, p. 37.
[18] Razzell, *Population,* pp. 91, 103-05, 111,-12; 133; Razzell, *Mortality,* pp. 37-41. Hollingsworth found that infant mortality 'was roughly constant from the beginning of registration in 1837 until about 1903 for the general population, but had been declining at least since the middle of the eighteenth century for the nobility.' T.H.

Lower infant and child mortality levels amongst the wealthy continued throughout the nineteenth century,[19] although at significantly reduced levels than in the seventeenth century.

However, areas with different socio-economic profiles showed if everything a reverse pattern. This can be illustrated with reference to London, where the Registrar-General provided data on mortality by registration sub-district. He classified districts by poverty levels as measured by average rateable value.

Table 4: Infant, Child and Adult Mortality per 1000 in London by Rateable Value of Registration District, 1839-44.[20]

Registration Districts	*Mean Annual Value of Rated Property*	*Infant Mortality*	*Child Mortality*	*Adult (25-44) Male Mortality*
10 Districts With Lowest Rateable Value	£15	153	52	13
10 Districts With Medium Rateable Value	£26	168	59	15
10 Districts With Highest Rateable Value	£58	167	58	13

Most of the poor districts were in the East End of London, and the wealthy ones in the West End.[21] The difference in mortality levels in these districts was not highly significant, but with a slightly increased mortality in the wealthy ones – probably a function of the 'hazards of wealth' – the consumption by the wealthy of tobacco, strong alcoholic liquor, excesses of unhealthy food, and the lack of regular exercise.[22] This pattern of mortality in London continued until the end of the nineteenth century.[23]

These surprising findings are replicated in other districts of England. In the period 1851-60, mortality levels in the wealthy towns of Bath, Cheltenham, Richmond and Brighton were significantly higher than in poorer districts in the same county.[24] The wealthy areas were towns, and the poorer areas rural districts, indicating that disease environment was more important in these instances than poverty in shaping mortality levels.[25]

Given the historical absence of accurate descriptions of the diseases involved, it is not possible to analyse the disease patterns occurring over the four centuries covered by the present paper.[26] However, bubonic plague was well recognised and had made a significant impact on mortality levels from the fourteenth century onwards, but disappeared for no obvious reason in the late seventeenth century. It is also possible to analyse one other disease – smallpox – which was sufficiently distinct and recognised by contemporaries. It was a very mild disease in the sixteenth century, killing under five per cent of young children attacked in

---

Hollingsworth. *The Demography of the British Peerage*, Supplement to *Population Studies*, Volume 18, No. 2, p. 72.

[19] Razzell, *Population,* pp. 112-14.

[20] See Ibid, p. 136.

[21] Ibid.

[22] Ibid, pp.177-195.

[23] See P. Razzell, 'Rateable value as a historical measure of socio-economic status' on the Academia website.

[24] Razzell, *Mortality*, p. 41

[25] See R. Woods *The Demography of England and Wales*, 2000, pp. 170-202 for an analysis of the mortality differences between urban and rural districts in this period.

[26] Razzell, *Population,* pp. 140-142.

London at the end of the century.[27] The disease became progressively more virulent up to the end of the nineteenth century, so that by the 1880s it killed nearly forty-five percent of unvaccinated children attacked in London.[28] It was only the widespread practice of inoculation/variolation and vaccination which prevented the population from being significantly decimated.[29]

Smallpox also varied in its age incidence in different parts of England: in the south of England it was a disease of both children and adults, whereas in the north and elsewhere it affected mainly young children. This was important as case-fatality rates varied significantly between different age groups.[30]

There were medical and other developments that helped reduce infant and child mortality: the introduction of better personal and public hygiene, the elimination of malaria through the drainage of marshlands, the introduction of washable cotton clothing, and the transformation of midwifery practices.[31] Some of these improvements may have helped reduce adult mortality, but as we saw earlier the overall evidence suggests that there was an 'autonomous' fall in this form of mortality in the eighteenth century.

In 1965, H.J. Habakkuk presented a 'heroically simplified version of English history' elaborating the role of population growth:

> ... long-term movements in prices, in income distribution, in investment, in real wages, and in migration are dominated by changes in the growth of population. Rising population: rising prices, rising agricultural profits, low real incomes for the mass of the population, unfavourable terms of trade for industry – with variations depending on changes in social institutions, this might stand for a description of the thirteenth century, the sixteenth century, and the early seventeenth, and the period 1750-1815. Falling or stationary population with depressed agricultural profits but higher mass incomes might be said to be characteristic of the intervening periods.[32]

This conclusion rests on the assumption that population growth was exogenous to economic development, a conclusion largely supported by a previous review of demographic evidence.[33] As a result of these trends a process of polarisation took place in English society during the sixteenth century: Lawrence Stone noted that 'the excess supply of labour relative to demand not only increased unemployment, but forced down real wages to an alarming degree ... [there was] a polarisation of society into rich and poor: the upper classes became relatively more numerous and their real incomes rose; the poor also became more numerous and their real incomes fell.'[34]

This has been confirmed by Alexandra Shepard in her study of church court depositions:

[27] P. Razzell, *The Conquest of Smallpox*, 2003, p. 169.
[28] Ibid.
[29] Ibid.
[30] Ibid, pp. x-xix.
[31] Razzell, *Population*, pp. 141-143.
[32] P. Razzell, *Essays*, 2021, p. 222.
[33] See Razzell, *Mortality*.
[34] Razzell, *Population*, p. 238.

Table 5: Median Wealth in England, deflated to 1550-1559 Values, by Social Group Over Time.[35]

	1550-74	1575-99	1600-24	1625-49
Gentry (N = 367)	£16.00	£8.00	£59.30	£50.00
Yeomen (N = 1104)	£5.34	£7.27	£23.92	£50.00
Craft/Trade (N = 2185)	£2.40	£1.40	£2.99	£5.00
Husbandmen (N = 2127)	£4.00	£3.37	£5.93	£5.00
Labourers (N = 273)	£1.58	£1.35	£1.36	£1.03

Although the gentry increased their wealth – increasing by about three times – yeomen's wealth had grown nearly ten times, while labourers' worth decreased slightly. There was little change among husbandmen and a doubling of wealth among craft/tradesmen. This data suggests that this was a period of 'the rise of the yeomanry' during the first half of the seventeenth century. Wrightson has summarized the situation of yeomen:

> Like the gentry, they benefited from low labour costs as employers, while as large-scale producers they stood to gain from rising prices ... Again like the gentry, they took a thoroughly rational and calculating attitude towards profit ... often ambitious, aggressive, [and] small capitalists ... [they experienced] gradually rising living standards, the rebuilding of farmhouses and their stocking with goods of increasing sophistication and comfort.[36]

Yeomen were part of the 'middle sort' who dominated the support for Parliament in the civil war and were the principal supporters of puritanism at this time.[37] This 'middle sort' were often the main traders in market towns, including Stratford-on-Avon, where Shakespeare and his contemporaries were practitioners of the forestalling of grain and other illegal trading activities. Not only did local tradesmen engage in the hoarding of grain during a period of scarcity, but all four local landed magistrates had arrangements with the townsmen to illegally store large stocks of grain on their behalf.[38] In 1601 the poor of Stratford were 'in number seven hundred and odd, young and old – something like forty per cent of the total population.'[39] As a result, the hoarding of grain resulted in threatened violence and riot by the poor, but they unwittingly appealed to the magistrates without realizing that they were some of the leading hoarders of grain.[40]

There was a similar period of economic and social polarization at the end of the eighteenth and beginning of the nineteenth century as a result of population growth. Malthus summarized this trend through his statement that 'farmers and capitalists are growing rich from the real cheapness of labour.'[41] This resulted in the impoverishment of labourers during this period. In a letter to the Duke of Clarence in 1790 Nelson described the condition of the poor in Norfolk:

> That the poor labourer should have been seduced by promises and hopes of better times, your Royal Highness will not wonder at, when I assure you, that they are really in want of everything to make

[35] Data from *Perceptions of Worth and Social Status in Early Modern England* , ESRC Reference Number RES-000-23-1111.
[36] Wrightson, *English Society*, pp. 134, 135.
[37] See P Razzell, 'A sociological analysis of the English civil war', in Razzell, *Essays.*
[38] Ibid, p. 122.
[39] Ibid.
[40] Ibid.
[41] Razzell, *Essays*, p. 222. For a bibliography of evidence for the low wages of labourers during this period see K.D.M. Snell, *Annals of the Labouring Poor*, 1985.

life comfortable. Hunger is a sharp thorn, and they are not only in want of food sufficient, but of clothes and firing.[42]

Nelson also claimed that labourers could not afford candles, soap or shoes, and for 'drink nothing but water, for beer our poor labourers never taste.'[43]

One of the most detailed and reliable accounts was provided by the Reverend John Howlett, who had been the Vicar of Great Dunmow in Essex for about 50 years. Describing the condition of labourers he wrote in 1796:

> … for the last forty or fifty years, some peculiarly favoured spots excepted, their condition has been growing worse and worse, and is, at length, become truly deplorable. Those pale famished countenances, those tattered garments, and those naked shivering limbs, we so frequently behold, are striking testimonies of these melancholy truths.[44]

He argued that these developments were the result of 'the rapid increase of population on the one hand and from the introduction of machines and variety of inventions … [which have led to] more hands than we are disposed or think it advantages to employ; and hence the price of work is become unequal to the wants of the workmen.'[45] He compiled figures of income and expenditure in his parish, using details of wages from farmers' wage books and local knowledge of family incomes and consumption, for the two ten-year periods, 1744-53 and 1778-87. The annual expenditure per family in the first period was £20.11s.2d and earnings £20.12.7d, leaving a surplus of 1s.5d. In the second period the figures were £31.3s.7d and £24.3.5d, leaving a deficit of £7.0s.2d.[46] Howlett concluded that

> Of this deficiency the rates have supplied about forty shillings; the remaining £5 have sunk the labourers into a state of wretched and pitiable destitution. In the former period, the man, his wife, and children, were decently clothed and comfortably warmed and fed: now on the contrary, the father and mother are covered with rags; their children are running about, like little savages, without shoes or stockings to their feet; and, by day and night, they are forced to break down the hedges, lop the trees, and pilfer their fuel, or perish with cold. [47]

Cobbett presented detailed evidence of the pauperisation of labourers at the end of the eighteenth century. By 1805 he came face to face with the poverty of southern agricultural workers:

> The clock was gone, the brass kettle was gone, the pewter dishes were gone; the warming pan was gone … the feather bed was gone, the Sunday-coat was gone! All was gone! How miserable, how deplorable, how changed the Labourer's dwelling, which I, only twenty years before, had seen so neat and happy.[48]

---

[42] N.H. Nicolas, *The Dispatches and Letters of Vice Admiral Lord Viscount Nelson, Volume 1, 1777-94*, 1845, p. 295.
[43] T. Coleman, *Nelson*, 2002; Nicholas, *The Dispatches*, p. 297.
[44] J. Howlett, *Examination of Mr Pitt's Speech in the House of Commons ... February 12th, Relative to the Condition of the Poor*, 1796, p. 2
[45] Ibid, p.19. Technology was clearly important in displacing labour during the eighteenth and nineteenth centuries, but this issue is beyond the scope of the present paper.
[46] Ibid.
[47] Ibid, p. 49. For budgets of labouring families in 1796 which showed an almost universal deficit of expenditure over income, see D. Davies, *The Case of Labourers in Husbandry*, 1796, pp. 7, 176-227; F.M. Eden, *The State of the Poor*, Volume 3, 1797, pp. cccxxxix-cccl. Davies and Eden compiled between them budgets in twenty-three counties of England.
[48] W. Cobbett, *Rural Rides*, 2001, p. x.

The Captain Swing riots in 1830 occurred widely in southern and eastern counties, and according to Hobsbawm and Rude 'the basic aims of the labourers were singularly consistent: to attain a minimum living wage and to end rural unemployment ... [much of it the result of] a permanent surplus of labour ... due in the first instance to the growth of population.'[49]

There is some evidence that the pauperisation of the working class was not confined to the South of England.[50]. Charles Shaw in his autobiography described the conditions of workers in the Staffordshire Potteries in the 1830s and 1840s:

> All the great events of the town took place … [in] the market place. During the severity of winter I have seen one of its sides nearly filled with stacked coals. The other side was stacked with loaves of bread, and such bread. I feel the taste of it even yet, as if made of ground straw, and alum, and Plaster of Paris. These things were stacked there by the parish authorities to relieve the destitution of the poor. Destitution, for the many, was a chronic condition in those days, but when winter came in with its stoppage of work, this destitution became acute, and special measures had to be taken to relieve it. The crowd in the market-place on such a day formed a ghastly sight. Pinched faces of men, with a stern, cold silence of manner. Moaning women, with crying children in their arms, loudly proclaiming their sufferings and wrongs. Men and women with loaves or coals, rapidly departing on all sides to carry some relief to their wretched homes − homes, well, called such … This relief, wretched as it was, just kept back the latent desperation in the hearts of these people.[51]

Not all workers were resigned to the poverty they experienced at this time. John Buckmaster described in his autobiography the political turmoil that occurred in Buckinghamshire during the 1830s:

> Numbers of men were out of work, bread was dear, and the Chartist agitation was violently active. Copies of the *Northern Star* and other Chartist papers found their way into every workshop. Meetings were held almost every evening and on Sundays. Some of the speeches advocated physical force as the only remedy … Lectures on Peterloo, the Bristol Riots, the Monmouth Rising, and the Pension List were common. Bad trade, low wages, and dear bread were the stimulating causes of widespread discontentment. Men were driven to their lowest depth of hatred of the governing classes ... the country was passing through the throes of a political convulsion which was fast ripening into a revolution. The mechanics institute gradually degenerated into a violent revolutionary club.[52]

The country was saved from revolution by the reduction in the price of bread and other economic and political changes. The fall in bread prices occurred largely as a result of the importation of wheat and other commodities from the United States and elsewhere.

Table 6: The Mean Price of Bread in London, 1700-1900.

Period	Mean Price of Four Pounds of Bread in London (Pence)[53]
1700-1749	5.1
1750-1799	6.4
1801-1851	10.7
1852-1900	7.4

[49] E.J. Hobsbawm, G. Rude**,** *Captain Swing*, 1973, pp. 22, 163.
[50] P. Razzell, R. Wainwright, *The Victorian Working Class*, 1973, pp. xix-xxiv.
[51] C. Shaw, *When I Was a Child*, 1980, pp. 42, 43.
[52] J. Buckmaster, *A Village Politician*, 1982 pp. 98, 99, 124, 153. For a detailed account of the political consequences of the pauperisation of the working class see E.P. Thompson, *The Making of the English Working Class,* 1980.
[53] B.R. Mitchell, P. Deane *Abstract of British Historical Statistics*, 1971, pp. 497, 498.

The price had risen significantly during the eighteenth and the first half of the nineteenth century, but then fell during the second half of the century.

Conclusion.

Disease patterns were responsible for the rise and fall of population growth, which had a major impact on the supply of labour. During periods of falling mortality, labour surpluses were created which affected both the price of labour and patterns of inequality. Most economists have seen demography as a function of economics, but this paper illustrates the way disease and mortality shaped both the economy and the structure of society. This was true both historically but also in recent times, when the elimination of diseases in Asia led to a surge in population growth and the creation of labour surpluses.[54] A number of countries – in particular China – took advantage of these surpluses to create cheap manufactured goods, which they exported to developed economies, including England, the United States and Europe.[55] This in turn resulted in the growth of economic and social inequality in these countries, with the virtual elimination of manufacturing activity and the creation of economic rustbelts.[56]

Epidemiologists have not always recognized the central importance of their discipline to the social sciences, but hopefully the present paper will contribute to a recognition of its centrality.

[54] Razzell, *Essays*, pp. 322-334.
[55] Ibid.
[56] Ibid.

IJE vol.33 no.6 © International Epidemiological Association 2004; all rights reserved.
Advance Access publication 15 July 2004

International Journal of Epidemiology 2004;**33**:1228–1233
doi:10.1093/ije/dyh226

Poverty, birthweight, and infant weight gain in Hertfordshire, 1923–1939

Peter Razzell,[1] Christine Spence[1] and Karen Vines[2]

Accepted 5 April 2004

Objective To investigate the association between poverty, birthweight, and infant weight gain in Hertfordshire, 1923–1939.

Design Cohort study based on the Hertfordshire Health Visitors' Register (HHVR).

Setting The population of Hertfordshire, and a sub-sample of five Hertfordshire towns—Hoddesdon, Berkhampstead, Hertford, Hitchin, and Bishops Stortford—extracted from the HHVR.

Subjects Some 71 201 live birth entries in the HHVR and a sample of 13 649 live birth entries for the five towns.

Measure of poverty Rateable value of birth addresses reflecting market and rental value of housing

Main outcome measures Birthweight, and infant weight gain (z score of weight at one year minus z score of birthweight).

Results In Hertfordshire as a whole there was a reduction in mean birthweight from 7.7 pounds (lbs) in 1923 to 7.4 lbs in 1939. Over the same time period there was an increase in mean infant weight gain, although with a degree of variation within the trend. In the sample of five towns there was no association between rateable value and birthweight, but a significant association between rateable value and both weight at one year, and weight gain during the first year of life.

Conclusion In Hertfordshire average birthweight declined, whereas weight gain during the first year of life tended to increase, at a time when, nationally, calorific intake and per capita consumption of a range of nutritional ingredients was rising. Poverty, as measured by rateable value, did not correlate with birthweight but was associated with weight gain during the first year of life. These findings suggest that nutritional poverty had a more significant influence on post-natal weight gain than it did on birthweight.

Keywords Birthweight, infant weight gain, poverty, rateable value, nutrition

Downloaded from https://academic.oup.com/ije/article/33/6/1228/866432 by guest on 05 June 2022

Since the beginning of the 20th century, a range of evidence has emerged for a link between infant development and adult mortality. Kermack, McKendrick, and McKinley reviewing data for England, Wales, Scotland, and Sweden in 1934 found a cohort association between high levels of childhood and adult mortality during the 19th and early 20th centuries.[1] Subsequently Forsdahl, Buck, Simpson, Barker, and others observed a geographical association between high infant mortality rates at the beginning of the 20th century, and elevated death rates from coronary heart disease in the 1960s and 1970s.[2–4] More recently, Barker *et al*. found, at the individual level, a link between low birthweight and weight at one year in the period 1911–1939 and a range of later adult diseases, including higher mortality from strokes, heart disease, and certain types of cancer in Hertfordshire.[5] Barker *et al*. have focused on the influence of maternal nutrition on birthweight

Correspondence: Peter Razzell, Department of History, University of Essex, Wivenhoe Park, Colchester, CO4 3SQ, UK. E-mail: peter.razzell@clara.co.uk

[1] Department of History, University of Essex, UK.

[2] Department of Statistics, The Open University, UK.

and weight at one year. They have emphasized the importance of the mother's life-long nutrition,[5] an emphasis which reflects a long tradition of medical thought.[6]

The association between low birthweight and weight at one year and higher adult disease mortality has been confirmed in subsequent studies for a number of different countries,[7] and other research has indicated a general link at the individual level between childhood socioeconomic conditions and cause-specific adult mortality.[8] Lucas *et al*. have however recently stressed the role of low infant growth in the explanation of higher adult mortality.[9–11]

The present paper examines the evidence on poverty and birthweight and weight at one year in Hertfordshire from 1923 to 1939, a place and period central to the development of the fetal origins hypothesis.

Methods

The primary dataset was derived from the Hertfordshire Health Visitors' Register (HHVR) covering the period 1923–1939. The dataset has been described in detail by Barker *et al*., and has been used in a series of studies on fetal/infant development and subsequent adult disease mortality.[5] Information on the following variables was extracted from the register: (1) name of child; (2) birth address; (3) birthweight; (4) weight at one year; and (5) mortality in the first year of life. Not all entries in the register contained information on the variables covered by the research. Of the 71 201 total live births (excluding known multiple births), 52 607 (73.9%) had information on birthweight. The percentage of births in the HHVR with information on birthweight was as follows: 1923–1925 66.7%; 1926–1930 76.3%; 1931–1935 72.3%; and 1936–1939 76.3%.

In all, 8948 children were recorded in the register as having died or left in their first year. Of the remaining 62 253 children, 49 459 (79.4%) had a weight at one year recorded and 46 891 (75.3%) had both weight at one year and birthweight registered.

A sub-sample of 13 649 live, full-term births for five towns—Hoddesdon, Berkhampstead, Hertford, Hitchin, and Bishops Stortford—was selected for special analysis. This represented all the children on the registers for these towns for the period 1923–1939, excluding recorded multiple births. Of these children, 10 458 (76.6%) had information on birthweight, 9699 (71.1%) had weight at one year recorded, and 9268 (67.9%) had information on both birthweight and weight at one year.

Detailed examination of the data suggests that birth and infant weights were recorded with a varying degree of accuracy. However, mean values were calculated for all weights, and a simulation study indicated that the rounding of weights did not significantly affect results.

Direct information on father's occupation, family income and housing conditions was not available. Data, however, existed on the rateable value of houses, a numerical measure based on the market value and rent levels of property, indirectly reflecting both family income and housing conditions. Information was collected on rateable values taken from Rating Valuation Registers for the five towns (1923–1939). Rateable values were assigned to the birth addresses listed in the HHVR, enabling a direct link to information on birthweight and weight at one year. Data on rateable value was available for 9357 birth addresses, 68.6% of the total. Birthweight was unrecorded for only 11% of children with birth addresses which had relatively low rateable values (≤£14), but for 16%, 25%, and 38% of children when the corresponding rateable value was £15–£18, £19–£22, and £23+ respectively. Middle class families living in houses with higher rateable values are therefore under-represented in the sample, possibly distorting the findings on rateable value and birthweight.

In total, children for whom information existed in the HHVR and who could be located in rates registers were as follows: information on both birthweight and rateable value 7968 out of a total of 13 649 (58.4%), data on both weight at one year and rateable value 7451 out of total of 13 649 (54.9%).

For both birthweight and weight at one year, z-scores were calculated, the standardization being based on the mean and standard deviation for the data as a whole. This enabled an analysis of the relative gain during the first year of life, studied via the change in birthweight and weight at one-year z scores. Differences in mean birthweight, weight at one year, and relative gain during the first year were tested using ANOVA. In the secular analysis linear trends were tested through the regression of weights on birth year. Similarly, trends in the analysis of poverty and weight were evaluated by allocating numerical values—1, 2, 3, etc—to the rateable value groups, avoiding a few very high rateable values having undue influence.

Results

Secular changes in birthweight and weight at one year in Hertfordshire, 1923–1939

During the period 1923 to 1939 the mean birthweight for live births fell from 7.7 pounds (lbs) in 1923 to 7.4 lbs in 1939 (Figure 1). The trend was approximately linear (deviation from linear trend $P = 0.124$), corresponding to a reduction in mean birthweight of 0.18 lbs per year (95% CI: 0.016, 0.020). This trend however only accounts for 0.5% of the variation in birthweight.

The decline in mean birthweight does not appear to be a function of larger numbers of low birthweight children surviving. Inclusion of the stillbirth rate for each year into the regression model did not moderate the linear trend over time. Nevertheless there were differences in stillbirth rates from year to year and some evidence of a trend [change in the odds ratio (OR) of

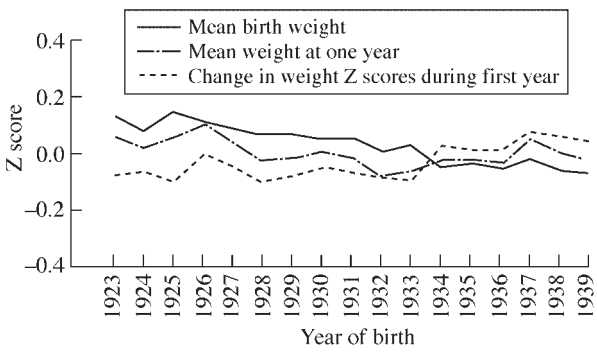

Figure 1 Percentage change in mean birthweight, weight at one year, and relative weight gain during the first year

Downloaded from https://academic.oup.com/ije/article/33/6/1228/866432 by guest on 05 June 2022

1.009 per year, 95% CI: 1.000, 1.018]. The percentage of stillbirths as a proportion of all births was as follows: 1922–1925: 2.6%, 1926–1930: 3.0%; 1931–1935: 2.7%; 1936–1939: 3.0%.

During 1923–1939 the mean weight at one year varied significantly ($P < 0.001$) from a high of 22.0 lbs in 1926 to a low of 21.5 lbs in 1932. Although in part this variation could be ascribed to a linear trend of –0.015 lbs per year (95% CI: −0.020, −0.011), there was also significant non-linearity to the pattern over time (test for non-linearity $P < 0.001$).

Like weight at one year, the relative change in weight in the first year varied significantly over the time period ($P < 0.001$), but in a complicated way. There was significant linear trend ($P < 0.001$) but a degree of variation within the trend (deviation from linear trend, $P < 0.001$). Nevertheless it is noteworthy that for births during the period 1923–1933, the mean change in z-scores was negative whilst for births during 1934–1939, the mean change in z-scores, was positive. Furthermore there was a linear trend of 0.010 per year (95% CI: 0.008, 0.012) in z-score change. Thus generally there were higher weight gains associated with the latter part of the period studied. (Figure 1).

Poverty and infant mortality, birthweight, and weight gain during the first year of life

Infant mortality is a measure known to be linked to poverty and social class in the first half of the 20th century,[12] and used widely in research on infant development and adult disease mortality.[2–4,13,14] In order to evaluate the effectiveness of rateable value as a measure of poverty, an analysis was carried out of the relationship between rateable value and infant mortality in the five towns. Infant mortality was calculated by expressing the number of infants known to have died in the first year as a proportion of the number of live births. Table 1 summarizes the findings for the five towns on the relationship between rateable value and infant mortality, as well as rateable value and birthweight and relative weight gain in the first year.

Infant mortality was generally lower in the higher rateable value groups. Modelling infant mortality using logistic regression suggests that the trend across rateable value groups is statistically significant. The OR for infant mortality between successive rateable value groups is estimated to be 0.89 (95% CI: 0.82, 0.97), confirming that rateable value is an effective measure of poverty associated with infant mortality.

There was little evidence of a link between rateable value and birthweight (one-way ANOVA, $0.1 > P > 0.05$). This lack of a link might be due to selective recording of birthweights in the different rateable value groups. However, analysis of the infant mortality of children suggests that the trend in infant mortality (OR = 0.78, 95% CI: 0.72, 0.85) was stronger amongst children with recorded birthweights than amongst all children—both with and without recorded birthweight—covered by Table 1. This suggests that any patterns in birthweight with respect to rateable values are not strongly biased by selective recording issues.

There was also no significant association between rateable value and stillbirths, indicating that survival of low birthweight children did not play a role in the relationship between rateable value and birthweight.

In contrast, weight at one year and weight gain in the first year were both significantly associated with rateable value (in both cases one-way ANOVA, $P < 0.001$). Both mean weight at one year and mean weight gain were generally higher in the higher rateable value groups. These findings suggest that poverty (as measured by rateable value) had little or no influence on birthweight, but a significant effect on infant weight gain in Hertfordshire during the period 1923–1939.

Discussion

There was a linear although slight decline in mean birthweight between 1923 and 1939. This was a period when per capita incomes and consumption of food rose significantly in the UK. Consumers' expenditure per head on food at constant prices was as follows: 1920–1924 £22.61; 1925–1929 £24.59; 1930–1934 £26.58; 1935–1938 £27.26.[15] Growing per capita expenditure on food was associated with an increase in most

Table 1 Rateable value, stillbirths, infant mortality, birthweight, and relative weight gain in first year in Hoddesdon, Berkhampstead, Hertford, Hitchin, and Bishops Stortford, 1923_01939 (95% CI)

Rateable value (£)	Stillbirths as a proportion of all births	Infant mortality (per 1000 births)	Birthweight ht (lbs)	Weight at one year	Relative weight gain in first year changes in Z scores
3–6	3.5% (2.2%, 5.1%)	43 (29, 61)	7.5 (7.4, 7.6)	21.1 (20.9, 21.3)	−0.26 (−0.31, −0.17)
7–10	3.0% (2.3%, 3.9%)	42 (34, 52)	7.6 (7.6, 7.6)	21.7 (21.6, 21.8)	−0.10 (−0.12, −0.04)
11–14	2.6% (1.8%, 3.7%)	35 (25, 47)	7.6 (7.5, 7.6)	21.7 (21.6, 21.9)	−0.06 (−0.11, −0.00)
15–18	2.8% (1.6%, 4.5%)	34 (29, 53)	7.6 (7.5, 7.6)	22.1 (21.9, 22.2)	+0.05 (−0.03, +0.13)
19–22	3.6% (1.8%, 6.4%)	24 (10, 48)	7.5 (7.3, 7.6)	21.9 (21.7, 22.2)	+0.13 (−0.01, +0.24)
23+	2.4% (1.2%, 4.2%)	28 (15, 47)	7.5 (7.4, 7.6)	21.9 (21.7, 22.1)	+0.06 (−0.04, +0.16)

Downloaded from https://academic.oup.com/ije/article/33/6/1228/866432 by guest on 05 June 2022

nutrients available for consumption.[15] Overall calories available for consumption increased from 3214 in 1920–1924 to 3432 in 1930–1934, although there was a slight decline to 3400 in 1935–1938.[15]

There are no direct figures on per capita consumption of food available for Hertfordshire during the pre World War II period, but there is evidence of increasing prosperity which was reflected in the changing class structure of the county: the proportion of professional, commercial, or administrative occupations increased from 22% of the total in 1921 to 26% in 1931, and 31% in 1951.[16–18]

The decline in birthweight between 1923 and 1939 may have been partly due to an increasing proportion of women who smoked during pregnancy, although the data is too piecemeal to allow precise calculations. However, total annual consumption of tobacco increased in the UK amongst women from 0.8 thousand tons in 1923 to 9.5 thousand tons in 1939, and subsequently to 23.5 tons in 1946, when about 41% of all women smoked.[19] There was little or no relationship between social class and smoking amongst women in 1946,[19] suggesting that smoking was not a factor in the relationship between poverty and birth and infant weight in the pre World War II period. Other demographic factors, such as changes in parity may also have played a part in the reduction of birth weight during this period.[20] Data are not currently available to clarify these issues, and these are topics to be explored in future research.

Studies carried out in England during the first half of the 20th century found no significant association between poverty and birthweight, but a strong association between family income and infant growth in the first year of life.[21,22] One of the most detailed of these studies was that carried out in Birmingham by Pooler,[23] a study not widely reported in the literature. The findings are summarized in Table 2.

There was little association between family income and weight at 3 weeks, but a progressive increase in the differences in infant weight between the income groups during the first year. By the age of one year there was a difference of 1 lb 10 oz in the average weight of children in the highest and lowest income groups. Assuming a standard deviation of 11/2 lbs for birthweights and 3 lbs for weights at one year, this indicates that income had little or no influence on birthweight but a strong impact on weight gain during the first year of life. The findings on poverty and weight in the first year of life in Birmingham are mirrored in the findings of the present study, with little or no association between rateable value and birthweight but a link between rateable value and weight gain in the first year of life.

In England social class and family income are known to have generally affected patterns of food consumption in this period. In 1936/37 families in the top 5% income group spent an average of about 17 shillings per head on food, compared with 6 shillings per head spent by the bottom 15%.[15] It was estimated that none of the top 5% were below the British Medical Association (BMA) food expenditure minimum, compared with 48% in the bottom 15% group.[15]

Poverty appears to have had little or no effect on birthweight in Hertfordshire during the period 1923–1939. As shown in the BMA study, social class and poverty affected women's life-long nutrition.[15] Although there is no statistical evidence available on the relationship between poverty and nutrition in the county during this period, there is documentary evidence that poverty had a significant effect on the nutrition of Hertfordshire women both during childhood and early adulthood in the pre World War II period.[24–26]

Birthweight is influenced by a wide range of environmental and biological factors, such as maternal age, height and weight, parity, as well as a parental propensity to diseases such as diabetes and coronary heart disease.[7, 27–29] Intergenerational associations have been shown with parental birthweight being associated with offsprings' birthweight.[30] Many of the studies have assumed that birthweight is largely shaped by patterns of maternal nutrition. However the exact influence of the long-term nutrition of mothers on the birthweight of their children is yet to be determined.[5,28,30–32]

Conclusion

Average birthweight appears to have declined in pre World War II Hertfordshire despite an apparent increase in per capita consumption of food and an increase in weight gain during the first year of life. In the first half of the 20th century, there was also little association between poverty and birthweight, but a significant link between poverty, weight at 1 year and infant weight gain. This suggests that poverty-related differences in nutrition played a more significant role in post-natal than pre-natal development.

Given the established links between birthweight and weight at one year and mortality from heart disease, strokes, and stomach cancer, further clarification of the relative roles of

Table 2 Average weight of infants by family income group, Birmingham, 1908–1913

	No. of families	Average income (shillings & pence)	Average weight of infants (lbs and oz)				
			Age 3 weeks	Age 13 weeks	Age 26 weeks	Age 39 weeks	Age 52 weeks
A1 (lower income families)	641	1.7	8.1	10.9	12.1	15.12	17.1
A2 (medium income families)	431	2.11	8.3	10.10	13.14	15.13	17.8
B (higher income families)	493	4.11	8.0	11.2	14.5	16.11	18.11

Downloaded from https://academic.oup.com/ije/article/33/6/1228/866432 by guest on 05 June 2022

biological, demographic, and environmental factors in birthweight and infant weight gain are important for an understanding of adult disease mortality. By unravelling the childhood determinants of adult disease in such detail, future research should help to clarify appropriate preventative health policies.

Acknowledgements

This work was funded by grants from the Wellcome Trust and the Economic & Social Research Council. The authors wish to thank David Barker and the MRC Environmental Epidemiology Unit at Southampton University for providing computerized information from the Hertfordshire Health Visitors' Register, and the staff of the Hertfordshire Record Office for their generous help.

References

[1] Kermack WO, McKendrick AG, MacKinley PL. Death rates in Great Britain and Sweden: some regularities and their significance. *Lancet* 1934;**226:**698–703.

[2] Forsdahl A. Are poor living conditions in childhood and adolescence an important risk factor for arteriosclerotic disease? *Br J Prev Soc Med* 1977;**31:**91–95.

[3] Buck C, Simpson H. Infant diarrhoea and subsequent mortality from heart disease and cancer. *J Epidemiol Community Health* 1982;**36:**27–30.

[4] Barker DJP, Osmond C. Infant mortality, childhood nutrition, and ischaemic heart disease in England and Wales. *Lancet* 1986;**343:** 1077–81.

[5] Barker DJP. *Mothers, Babies, and Disease in Later Life*. London: BMJ Publications, 1994.

[6] Mellanby E. Nutrition and child bearing. *Lancet* 1933,**ii:**1130–34.

[7] Leon D, Ben-Shlomo Y. Preadult influences on cardiovascular disease and cancer. In: Kuh D, Ben-Shlomo Y (eds). *A Life Course Approach to Chronic Disease Epidemiology*. Oxford: Oxford University Press, 1997, pp. 45–77.

[8] Davey Smith G, Hart C, Blane D, Hole D. Adverse socio-economic conditions in childhood and cause specific adult mortality: prospective observational study. *BMJ* 1998;**316:**1631–35.

[9] Lucas A, Early Nutrition and later outcome. In: Zieglar EE, Lucas A, Moro GE (eds). *Nutrition in the Very Low Birthweight Infant*. Philadelphia: Lippincott, Williams & Wilkins, 1999, pp. 1–18.

[10] Lucas A, Fewtrell MS, Cole TJ. Fetal origins of adult disease—the hypothesis revisted. *BMJ* 1999;**319:**245–49.

[11] Cole TJ. Early growth and coronary heart disease in later life, Letter. *BMJ* 2001;**323:**572.

[12] Woolf B. Studies on infant mortality, social aetiology of stillbirths and infant deaths in county boroughs of England and Wales. *Br J Prev Soc Med* 1947;**1:**73–125.

[13] Williams DRR, Roberts SJ, Davies TW. Deaths from ischaemic heart disease and infant mortality in England & Wales. *J Epidemiol Community Health* 1979;**33:**199–202.

[14] Leon DA, Davey Smith G. Infant mortality, stomach cancer, stroke and coronary heart disease: ecological analysis. *BMJ* 2000;**320:**1705–06.

[15] Stone R. *Measurement of Consumers Expenditure and Behaviour in the United Kingdom, 1920–38, 2*. Cambridge: Cambridge University Press, 1954.

[16] *1921 Census, Middlesex, Hertfordshire, Buckinghamshire, Oxfordshire, Northamptonshire*. London: HMSO, 1923.

[17] *1931 Census, Occupation Tables, Hertfordshire County*. London: HMSO, 1933.

[18] *1951 Census, Occupation Tables*. London: HMSO, 1953.

[19] Wald N, Nicolaides-Bounan A. *UK Smoking Statistics*. Oxford: Oxford University Press, 1991.

[20] Kramer MS. Determinants of low birth weight: methodological assessment and meta-analysis. *Bull World Health Organ* 1987;**65:** 663–737.

[21] Murray MB. *Child Life Investigations: the Effect of Maternal Social Conditions and Nutrition upon Birth Weight*. London: HMSO, 1924.

[22] M'Gonigle GCM, Kirby J. *Poverty and Public Health*. London: Victor Gollancz, 1936.

[23] Pooler HW. Infant mortality and the education of the mother. *Lancet* 1918;**July 6:**3–7.

[24] Paddick E, *Tales of a Hertfordshire Town*. Hoddesdon: Hoddesdon Urban District Council, 1971.

[25] Chuck J. *My Life in the Village*. Oral history, deposited in the Hertfordshire Record Office.

[26] Sangster E. *Children of the Angel: Growing Up in Hertford, 1910–1935*. Hertford: Hertford Oral History Group, 1999.

[27] Davey Smith G, Hart C, Ferrell C, Upton M, Hole D, Hawthorne V. Birth weight of offspring and mortality in the Renfrew and Paisley study: prospective observational study. *BMJ* 1997;**315:**1189–93.

[28] Lechtig A, Yarborough C, Delgado H, Habicht JP, Martorell R, Klein RE. Influence of maternal nutrition on birth weight. *Am J Clin Nutr* 1975;**28:**1223–33.

[29] Hypponen E, Davey Smith G, Power C. Parental diabetes and birth weight of offspring: intergenerational cohort study. *BMJ* 2003;**326:**19–20.

[30] Ward WP. *Birth Weight and Economic Growth*. Chicago: Chicago University Press, 1993.

[31] Mathews F, Judkin P, Neil A. Influence of maternal nutrition on outcome of pregnancy: prospective cohort study. *BMJ* 1999;**319:**339–43.

[32] Sand R. *Health and Human Progress*. London: Kegan Paul & Co, 1935.

Downloaded from https://academic.oup.com/ije/article/33/6/1228/866432 by guest on 05 June 2022

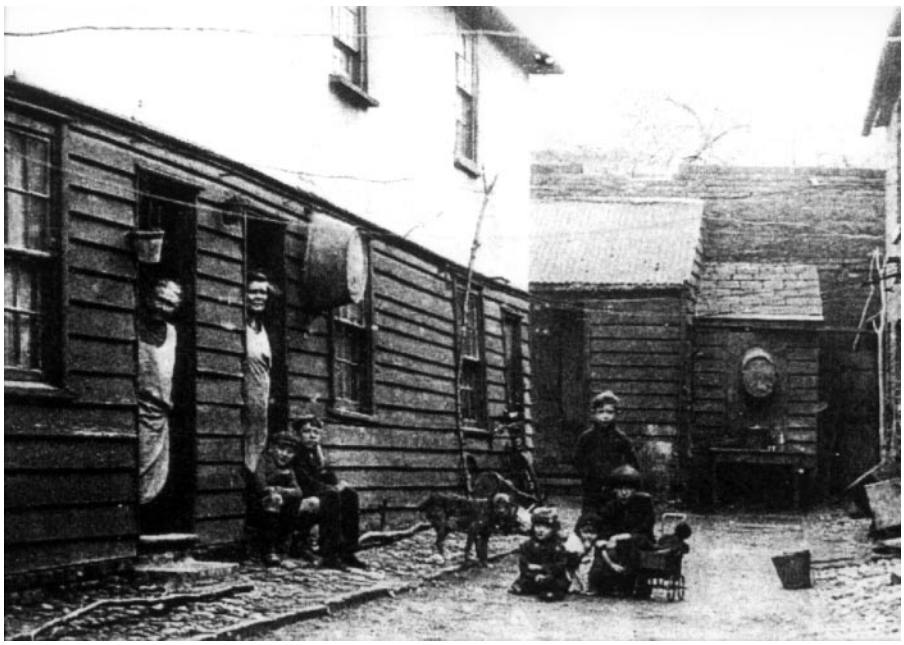

Photo courtesy of the Hertford Museum, Hertford.

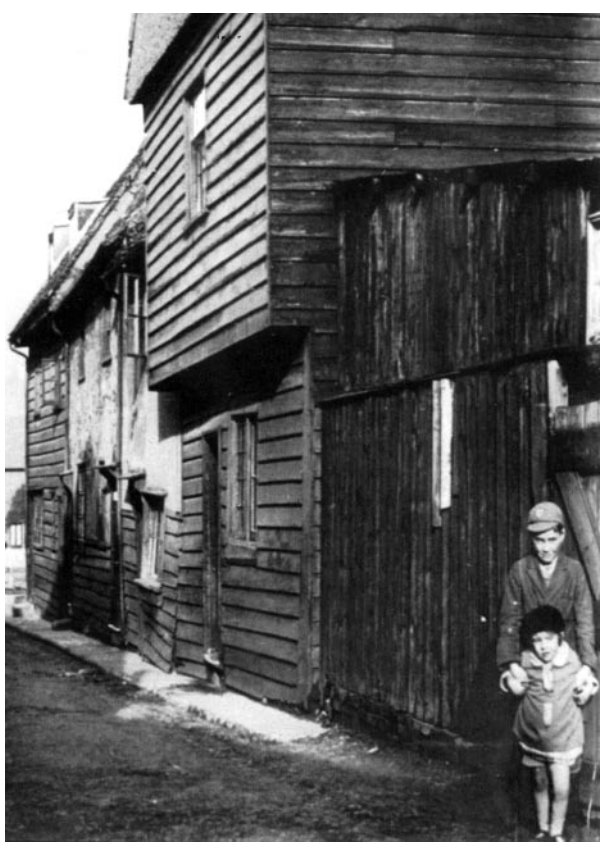

Photo courtesy of the Hertford Museum, Hertford.

Downloaded from https://academic.oup.com/ije/article/33/6/1228/866432 by guest on 05 June 2022

Published by Oxford University Press on behalf of the International Epidemiological Association *International Journal of Epidemiology* 2005;**34:**477–492

Letters to the Editor

Social capital and the history of mortality in Britain

From PETER RAZZELL* and CHRISTINE SPENCE

Sirs—Szreter and Woolcock have argued that demographic history has a significant contribution to make in the debate about the role of social capital in shaping health patterns. They illustrate this by focusing on the impact of social welfare on mortality in Britain during the eighteenth and nineteenth centuries. While agreeing with the authors about the importance of history, we will present evidence to suggest different conclusions about the historical role of social capital.

The authors' thesis on the historical relationship between social capital and mortality may be summarized in their own words as follows:

> The British polity had by the beginning of the 19th century established itself as the most prosperous, socially cohesive, and socially secure in Europe, proven through the capacity of its national security system, the Poor Law, to protect its citizens from local famines since the 17th century . . . . There was abundant and burgeoning bridging and linking social capital, particularly in the towns . . . . For almost a century, from the 1730s until the 1820s . . . its average life expectancy also steadily improved . . . . But then all this changes. For about a half a century, from the 1820s until the 1870s . . . the growing towns' physical environment were simply allowed to deteriorate as ever more workers crowded in to work in the money-making factories . . . the industrial urban workers and their families experienced a catastrophic crises in the second quarter of the 19th century . . . in the central parishes of cities such as Manchester, Liverpool and Glasgow, life expectancies dropped to about 25 years . . . . The breakthrough did not come until the 1870s . . . pioneered in the city of Birmingham through the political leadership of Joseph Chamberlain . . . [who] legitimized the moral and politically energizing imperative for the collective attack on squalor, poverty and disease.[1]

Although data on the history of mortality is incomplete, new research on long-term mortality raises serious questions about the above thesis. Detailed work, using parish registers for London and the county of Bedfordshire, suggests that infant and child mortality approximately doubled between the sixteenth and the eighteenth century, both amongst wealthy and non-wealthy families. In London mortality peaked in the middle of the eighteenth century, whereas in Bedfordshire and possibly elsewhere this peak in infant and child mortality did not occur in the general population until the second half of the eighteenth century.[2]

This is the period in which Szreter and Woolcock believe there was a benign political and social regime, providing effective bridging and other social capital, generating better health in the population. However, this is contradicted by the increase in mortality, which was probably a result of the growth in the virulence of smallpox, typhus, and other infectious diseases during this period. For example, the case fatality rate of smallpox increased in London from about 5% in the sixteenth century to approximately 45% amongst unvaccinated children in the 1880s, possibly due to the importation of more virulent strains with the growth of world trade.[3]

Increasing smallpox virulence may partly account for the low life expectancy in some areas in the second quarter of the nineteenth century. There is evidence that smallpox vaccination was neglected in Glasgow in this period,[4] and it is possible that there were variations in the pattern of urban mortality depending on the practice of vaccination and other measures. Mortality was also higher in Liverpool, Glasgow and Manchester because of an influx of poor lrish escaping famine and disease, which elevated mortality levels in the 1840s.[5,6] Additionally, birth registration was probably defective among lrish Catholics, artificially elevating infant mortality levels.[7]

The life expectancy levels quoted by Szreter and Woolcock for these cities are not representative of all urban areas in the middle of the nineteenth century. In the 1850s, life expectancy at birth in seven other English cities with populations above 100 000 was in the range of 35–39 years, compared with the 31 and 32 years for Liverpool and Manchester.[4]

Expectation of life at birth in England and Wales was 41 years in the 1850s, suggesting that the majority of urban areas did not suffer mortality significantly higher than elsewhere in this period. Gains in life expectancy in cities after the 1870s were not greater than for the country as a whole. For example, life expectancy in Birmingham increased from 37 to 42 years between the 1860s and 1890s, whereas the equivalent increase in England and Wales was 41 to 46 years,[10] suggesting that public health measures in Birmingham were not of especial importance in the reduction of mortality.

There is also evidence that the fall in infant, child, and adult mortality in urban areas during the late eighteenth and early nineteenth century was much more significant than that which occurred after the 1870s, indicating that the latter was not a key period of 'beakthrough'.[2] The most important city in Britain during the eighteenth and nineteenth centuries was London. In 1821, it had a population more than two-and-a-half times larger than that of Manchester, Liverpool, and Glasgow combined,[8] and dominated the economic, social, and cultural life of the country. A number of demographic studies have been carried out on London and they all indicate that infant, child, and adult mortality fell sharply between the middle of the eighteenth and nineteenth centuries. Approximately two-thirds of the children under the age of five died in the 1750s, a proportion which had fallen to about a third by the 1840s.[9–12] Much of the fall occurred in the nineteenth century, some of it probably in the second quarter of the century.[8,13]

Essex University, Department of History, Wivenhoe Park, Colchester, Essex CO4 3SQ, UK.

* Corresponding author. E-mail: peter.razzell@clara.co.uk

Downloaded from https://academic.oup.com/ije/article/34/2/477/747156 by guest on 07 October 2023

An important part of the debate about the role of social capital is the controversy about the reasons for the decline in mortality in the eighteenth and nineteenth centuries. Szreter is probably correct in concluding that shifts in the standard of living were not central in shaping mortality patterns.[14] Infant and child mortality increased between the sixteenth and middle of the eighteenth century at a time when real incomes were rising,[2] and fell in rural areas during the first half of the nineteenth century at a time when incomes were probably at best static.[15,16] More importantly, the historical relationship between social class and mortality suggests that living standards were not a primary factor in the mortality transition.

Although complete data is not yet available, provisional research suggests that infant, child, and adult mortality levels were similar among wealthy groups and the general population until the middle of the eighteenth century. Outside of London, it appears that infant and child mortality fell first among the professional and upper classes, and then subsequently—fifty or so years later—among the general population. There were major reductions in absolute levels of adult mortality among all social groups from the eighteenth century onwards, but there seems to have been little or no social class gradient in adult mortality in the eighteenth and the first half of the nineteenth century.[13]

Even by the end of the nineteenth century, there was only a minimal gradient in infant and adult mortality, although strong social class differences in child mortality had probably been established by the beginning of the nineteenth century.[2] The pattern of social class mortality reductions continued throughout the late nineteenth and the whole of the twentieth century. The fall in infant mortality at the end of the nineteenth and beginning of the twentieth century first took place amongst the professional and upper classes, and it is probable that similar changes occurred in the adult mortality gradient.[13,17–19]

Historically, the professional and upper classes appear to have played the leading role in introducing improvements in hygiene and medical practices which led to the reduction in mortality. They were the first to adopt—amongst other measures—inoculation (variolation) and vaccination against smallpox, the elimination of contaminated earth flooring in houses, the introduction of wash basins, baths, and water closets, and in the twentieth century, the reduction in the incidence of cigarette smoking. Some measures were promoted by local authorities—for example most districts in London introduced improvement acts in the middle of the eighteenth century,[20] and many rural parishes paid for the inoculation and vaccination of their poor.[3] However, many measures occurred as a result of changes in individual behaviour influenced by medical and other cultural developments.

The association between social class and mortality has a direct bearing on the debate about the role of social capital. Szreter and Woolcock point to the importance of 'bridging social capital', reflecting the work of Wilkinson, Marmot, and others on the influence of social inequality on health. Wilkinson and Marmot have argued that social inequality has a general impact on mortality levels, and have made reference to links between poverty and high mortality in eighteenth and nineteenth century England.[21–23] However, the minimal social class gradient in infant and adult mortality before the end of the nineteenth century suggests that social inequality was not a crucial dimension in the determination of health before the twentieth century.

It is possible that the epidemiological transition changed the relationship between social class and mortality in the twentieth century, although this does not easily fit with Wilkinson and Marmot's argument about the impairment of immunity from 'status stress'. Only further demographic research will help clarify these topics, but the debate on the history of social capital and health initiated by Szreter and Woolcock has made an important initial contribution to clarification of these central epidemiological issues.

References

[1] Szerter S, Woolcock M. Health by association? Social capital, social theory, and the political economy of public health. *Int J Epidemiol* 2004;**33:**650–67.

[2] Razzell P. *Essays in English Historical Demography*. London: Caliban Books, 2005.

[3] Razzell P. *The Conquest of Smallpox*. London: Caliban Books, 2004.

[4] Szreter S, Mooney G. Urbanization, mortality, and the standard of living debate: new estimates of the expectation of life at birth in nineteenth-century British cities. *Econ Hist Rev* 1998;**51:**84–112.

[5] Neal F. *Black '47: Britain and the Irish Famine*. London: MacMillan, 1998.

[6] O'Grada C. *Black' 47 and Beyond: The Great Irish famine in History, Economy and Memory*. Princeton, NJ: Princeton University Press, 1999.

[7] Mills D, Drake M. Using written sources: some further examples. In: Drake M, Finnegan R. (eds) *Studying Family and Community History, Vol. 4: Sources and Methods: a Handbook. Cambridge*: Cambridge University Press, 1994;109–20.

[8] Mitchell BR, Deane P. *Abstract of British Historical Statistics*. Cambridge: Cambridge University Press, 1971.

[9] Landers J. *Death and the Metropolis: Studies in the Demographic History of London, 1670–1830*. Cambridge: Cambridge University Press, 1993.

[10] Vann RT, Eversley DEC. *Friends in Life and Death*. Cambridge: Cambridge University Press, 1992.

[11] Razzell P. The conundrum of eighteenth-century English population growth. *Soc Hist Med* 1998;**11:**469–500.

[12] Woods R. *The Demography of Victorian England & Wales*. Cambridge: Cambridge University Press, 2000.

[13] Landers J. Mortality and Metropolis: the case of London 1675–1825. *Popul Stud* 1987;**41:**59–76.

[14] Szreter S. Author Response: Debating mortality trends in 19th century Britian. *Int J Epidemiol* 2004;**33:**705–709.

[15] Razzell P, Spence C. Poverty or disease environment? The history of mortality in Britain 1500–1950. In Breschi M, Pozzi L (eds). *The Determinants of Infant and Child Mortality in Past European Populations*. Udine, Italy: Forum, 2004.

[16] Harris B. Public health, nutrition and the decline of mortality: the McKeown thesis revisted. *Soc Hist Med* 2004;**17:**379–407.

[17] Haines MR. Socio-economic differentials in infant and child mortality during mortality decline: England and Wales 1891–1911. *Popul Stud* 1995;**49:**297–315.

[18] Wilkinson RG. Class mortality differentials, income distribution and trends in poverty 1921–1981. *J Soc Pol* 1989;**18:**307–35.

[19] Garrett E, Reid A, Szreter S, Schurer K. *As Others Do Around Us: Place, Class and Demography in England and Wales 1891–1911*. Cambridge: Cambridge University Press, 2001.

[20] Porter R. Cleaning up the Great Wen: public health in eighteenth century London. *Med Hist* 1991:**Suppl 11:** 61–75.

[21] Wilkinson RG. Health inequalities: relative or absolute material standards? *BMJ* 1997;**314:**591–95.

[22] Wilkinson RG. *Unhealthy Societies*. London: Routledge, 1996.

[23] Marmot M. *Status Syndrome*. London: Bloomsbury, 2004.

doi:10.1093/ije/dyi035
Advance Access publication 3 March 2005

Downloaded from https://academic.oup.com/ije/article/34/2/477/747156 by guest on 07 October 2023

The Hazards of Wealth: Adult Mortality in Pre-Twentieth-Century England

Summary. English historical evidence suggests that before the twentieth century, adult mortality may have been as high among the wealthy as it was among the poor. Provisional data for the eighteenth and nineteenth centuries indicate that in many areas, the aristocracy, gentry, merchants and professionals died in as great a number as labourers and poor husbandmen.
Given the known association between poverty and ill-health, this finding represents something of a conundrum. A review of literary evidence suggests that the ownership of wealth carried its own risks. Medical authorities and other writers described in detail the hazards of wealth: the excessive consumption of food, alcohol, and tobacco, linked to physical inactivity and other lifestyle factors. This paper suggests that the correlation between socio-economic status and adult mortality only emerged at the end of the nineteenth century, although this conclusion will require confirmation through further research on a systematic and nationally representative sample.

Keywords: wealth; poverty; mortality; lifestyle; alcohol; nutrition; tobacco; physical inactivity and obesity

The association between social class and adult mortality has become one of the key areas of research in twentieth-century epidemiology and demography. Recently, Wilkinson and Marmot have argued that there is a general link between social inequality and adult mortality, partly mediated through the impairment of immunity resistance resulting from 'status stress'. In support of this thesis, they have quoted references to links between poverty and high mortality in eighteenth and nineteenth century England.[1] Davey Smith and colleagues have stressed the role of lifestyle and life-course events, and have also cited historical evidence for a close association between poverty and ill-health.[2]

There is abundant historical and contemporary data to indicate that inadequate nutrition, poor housing and over-crowded environments result in increases in mortality.[3] However, much of the historical evidence for the association between poverty and adult mortality is based on flawed methodology and unreliable evidence.[4] We shall present research in this paper to suggest that before the twentieth century, male adult mortality in England may have been as high among the wealthy as it was in the general population, and in some periods and places may have been higher than it was among the poor.

There is some evidence to indicate that a social class gradient in infant and child mortality emerged in the eighteenth century. However, this was not true of adult mortality, and an association between socio-economic status and adult male mortality probably did not become fully established until the twentieth century.[5] Given the known link between poverty and mortality, this contradiction represents an historical puzzle which warrants further investigation. This paper will explore the possible reasons for this conundrum, discussing a range of evidence from contemporary sources, and linking this with current understanding of health and mortality among the adult population.

Given the provisional nature of the evidence, the central aim of the paper is not to provide definitive answers to the questions raised, but rather to stimulate a

debate about the potential hazards of wealth to health and mortality in the pre-twentieth-century period. The data we present are limited in scope, both in the size of samples and the geographical areas covered, and suffer from a lack of randomness due to the self-selected nature of much of the source material. However, the data are from a number of independent sources which suggest certain provisional conclusions, providing the basis for more systematic and comprehensive research in the future.

Socio-Economic Status and Adult Mortality before the Twentieth Century

One of the most reliable studies of socio-economic status and mortality before the twentieth century is that by Hollingsworth on the aristocracy. It is possible to compare his findings with those for England and Wales, in the middle of the nineteenth century, after the introduction of civil registration.

Table 1: *Expectation of Life at aged 20 amongst the Aristocracy and the Population of England and Wales (Years)*

Cohort Born	*Males*	*Females*
Aristocracy , 1825-49	42.0	48.3
England and Wales, 1840-1	39.2	41.7
Aristocracy , 1850-74	42.9	52.1
England and Wales, 1860-1	42.7	45.7

Source: Hollingsworth 1972, pp. 54, 58

Among men, the aristocracy had a slight advantage in life expectancy at age 20 in the first cohort, but this had disappeared by the later period, whereas female aristocrats had higher adult life expectancy in both periods.

These findings make no allowance for place and the role of disease environment in shaping mortality levels.[6] This can be illustrated through research published by the Victorian actuaries Bailey and Day in 1863. They compared the life expectancy of the peerage with that in the general population of England, as well as those living in healthy districts.

Table 2: *Mean Duration of Life amongst Males, Mid-Nineteenth Century*

Age	*Peerage Families*	*English Table Dr Farr*	*Healthy Districts Dr Farr*
20	41.46	39.99	43.40
30	35.51	33.21	36.45
40	28.33	26.46	29.29
50	21.40	19.87	22.03
60	14.56	13.60	15.06
70	8.77	8.55	9.37

Source: Hutcheson Bailey and Day 1863, p. 69

Life expectancy was slightly higher at all ages among the peerage than in the English population, although it was less than in those living in healthy districts. The aristocracy spent long periods living in London, in other towns and rural areas, all with different mortality risks. It is therefore important to present data, wherever possible, within geographical regions and districts, and to attempt to control for the role of place in shaping mortality levels.

The major problem with evidence on adult mortality before the advent of civil registration is the reliability of source material. Creating data through family reconstitution suffers from the problem of high migration, with only about ten per cent of reconstitution populations remaining in observation from birth to death.[7] There is also the difficulty of the unknown reliability of parish burial registers, and the problem of a variation in the reliability of data by socio-economic status. Research on the registration of child deaths using the same-name technique suggests that burial registers may have been more accurate in recording the deaths of the rich than of the poor.[8] However, there is no reliable evidence on the accuracy of adult burial registration by socio-economic status.

One way of addressing this problem is by analysing sources which give information on the mortality status of parents. Marriage licences and apprenticeship indentures were legally required to include information on consent of parents, in some cases by written affidavit, and where a father had died, this was usually indicated in the licence or indenture. However, the problem of self-selection means that these sources are not necessarily representative of the general population, although they do provide valuable evidence when viewed with other independent data. Marriage licences for East Kent yield data on occupation and paternal mortality for 289 parishes in the period 1619-1809. Table 3 gives the percentages of dead fathers of under-age daughters by occupational group.

Table 3: *Proportion of Deceased Fathers of Spinsters under 21 by Occupation of Husband in East Kent, 1619-1809 (Numbers in Cohort in Brackets)*

Period	*Occupation*				
	Gentlemen, Merchants and Professional	*Yeoman and Farmers*	*Traders and Artisans*	*Husbandmen*	*Mariners and Fishermen*
1619-1646	39% (205)	41% (274)	46% (491)	50% (213)	42% (144)
1661-1700	38% (131)	42% (169)	49% (326)	39% (122)	45% (103)
1751-1809	28% (159)	15% (207)	26% (397)	19% (108)	24% (158)

Source: Razzell 1994, p. 197

Table 3 indicates that adult mortality was slightly lower among gentlemen, merchants and professionals than in other occupational groups in the first two periods, but higher in the second half of the eighteenth century. The latter finding is confirmed by a study of marriage licences in Nottinghamshire and Sussex.

Table 4: *Proportion of Fathers of Spinsters and Bachelors under 21 Dead in Nottinghamshire and Sussex, 1754-1800*

Occupational Group	*Total Number of Cases*	*Number of Fathers Dead*	*Percentage of Fathers Dead*
Labourers and Servants	225	36	16%
Husbandmen	180	34	19%
Artisans and Tradesmen	582	123	21%
Farmers and Yeomen	457	76	17%
Gentlemen and Professionals	92	32	35%

For the source of data, see Blagg 1946-7; Shaw 1987; Macleod 1926 and 1929; Penfold 1917 and 1919

Although the sample sizes are small, the pattern is similar to that revealed in Table 3, but with a higher proportion of gentlemen and professional fathers dead. The higher mortality amongst the wealthy may have been partly a function of greater ages of fathers, but the limited amount of evidence does not support this conclusion. In the absence of birth control, the average age of fathers was probably largely shaped by age of marriage, and data from Nottinghamshire suggest that this did not vary greatly between different socio-economic groups in the first half of the eighteenth century. By the late nineteenth century, men from wealthier socio-economic groups married significantly later than those from the poorer social classes, but when this pattern first emerged is unknown.[9]

Table 5: *Median Age of Marriage of Grooms Listed in Nottinghamshire Marriage Licences, 1701-1753 (Number of Cases in Brackets)*

Period	*Gentlemen*	*Yeoman Farmers*	*Artisans and Tradesmen*	*Husbandmen*	*Labourers*
1701-20	26 (168)	26 (141)	25 (57)	27 (487)	26 (138)
1721-40	28 (118)	27 (186)	25 (133)	26 (695)	27 (89)
1741-53	25 (55)	25 (412)	24 (119)	26 (254)	25 (85)

Source: Chambers 1965, p. 332

There is additional evidence available on paternal mortality by socio-economic status during the early eighteenth-century period. Apprenticeship indentures include information on amount of premium paid and the occupation of fathers, and there was a strong association between occupation and premium level, with gentlemen, merchants and professionals paying the highest premiums, and labourers and servants paying the lowest ones.[10]

Table 6: *Mortality amongst Fathers listed in the British Apprenticeship Register 1710-13 by Amount of Premium Paid*

Premium Paid	*Number of Cases*	*Percentage of Fathers Dead*
£1-£5	541	23%
£6-£19	587	30%
£20+	532	34%

Source: Razzell and Spence 2004, p. 63

Table 6 indicates a positive correlation between wealth and adult mortality among apprentices' fathers. The association between wealth and mortality might be partly explained by the wealthy living more frequently in London and other unhealthy towns and cities, but as Table 7 indicates, even in an unhealthy area like London, there was a link between wealth and mortality.[11]

Table 7: *Mortality amongst London Fathers listed in the British Apprenticeship Register 1710-13 by Amount of Premium Paid.*

Premium Paid	*Number of Cases*	*Percentage of Fathers Dead*
£9 And Under	110	32%
£10-£19	93	41%
£20+	99	42%

Source: Razzell and Spence 2004, p. 54

Although the number of cases is small, there is still the same gradient between wealth and mortality in London as found nationally.

All the above evidence from marriage licences and apprenticeship indentures is subject to a measure of uncertainty because of the lack of exact information on the ages of fathers and the self-selected nature of the samples. More reliable data become available with the introduction of national censuses and civil registration in the nineteenth century. However, because of the way the data have been processed and interpreted, it is often itself of uncertain reliability. For example, Chadwick and others produced data to show that the wealthy lived longer than the poor, but this material was generated through a faulty methodology, using age at death as a measure of life expectancy, and not allowing for differences in the age structure of the population at risk.[12]

Farr produced evidence on the different registration districts of London, including information on their socio-economic characteristics and associated mortality levels.[13] He classified the mean rateable value of each district and published initial findings on two of the districts, which showed some association between wealth and mortality. He did not pursue this analysis but subsequently provided raw data for all districts which are analysed in Table 8.

Table 8: *Adult (25-44) Mortality in London, 1838-44*

Registration Districts	*Mean Annual Value of Rated Property on Each House*	*Adult (25-44) Male Mortality Per 1000*
10 Districts with Lowest Mean Rateable Value	£15	13
10 Districts with Medium Mean Rateable Value	£26	15
10 Districts with Highest Mean Rateable Value	£58	13

Source: Razzell 2006

The districts with the lowest rateable values were mostly in the East End and the wealthiest in the West End of London. Table 8 indicates that there was no significant association between the wealth of a district and its adult mortality level.

It is possible to construct reliable statistics of adult mortality for the period after 1841 in individual rural and urban parishes by using censuses and information in burial registers. This involves tracking married couples in the censuses of 1841 and 1851, and linking this data with that in the parish burial registers for the intervening years. This methodology has the advantage of triangulation, allowing the comparison of information about widows and widowers in the census of 1851 with that in the burial registers. The selection of married couples allows the measurement of independent demographic events for establishing the period at risk – the listing of a spouse in a burial register, the baptism of a child, or the enumeration of the husband or wife in a later census.

To evaluate the impact of socio-economic status on adult mortality, a sample was constructed for 47 Bedfordshire parishes,[1] selecting the first married couple with elite status in the census of 1841. All professional, merchant and independent families with at least one domestic servant were selected for the elite category – there was an average of 3.2 servants per family – and they were matched with the next labourer's family of a similar age in the census schedule. The age of labourers selected was within plus or minus five years of that of elite husbands.

Table 9: *Mortality amongst Husbands and Wives Enumerated In Bedfordshire Censuses, 1841-1851*

	Number of Grooms and Brides	*Number of Traced Cases*	*Number of Traced Cases Dead*	*Percentage of Traced Cases Dead*	*Number of Years at Risk*	*Average Age of Traced Cases (Years)*
Professional, Merchants and Gentlemen	250	165	26	16%	1531	39.8
Labourers	250	182	27	15%	1738	40.7

A total of 250 married couples were included in the sample – 125 from elite families and 125 from labourers' families. Of the 250 husbands and wives in the elite category, 165 were traced (66 per cent) either in the census of 1851 or the burial register; the equivalent figure for the labourers' sample was 182 out of 250 (73 per cent). Most of the untraced cases were probably due to migration, as they involved the disappearance of both husband and wife. It is unlikely that burials of both husband and wife were not registered, given the high quality of the burial registers in these rural parishes at this

[1] The parishes were chosen in sequence from the Registrar-General's list of censuses of 1841 and were as follows: Ampthill, Arsley, Aspley Guise, Bedford St Cuthbert's, Bedford St John's, Bedford St Mary's, Bedford St Paul's, Biggleswade, Blunham, Clifton, Clophill, Colmsworth, Cranfield, Dunstable, Eaton Socon, Flitton, Harrold, Haynes, Henlow, Higham Gobion, Holwell, Houghton Conquest, Houghton Regis, Hunwick, Kempston, Keysoe, Langford, Leighton Buzzard, Lower Gravenhurst, Luton, Melchbourne, Northill, Pertenhall, Poddington, Potton, Turvey, Renhold, Shefford, Shelton, Southill, Stotfold, Streathley, Tilbrook, Tingrith, Toddington, Turvey, Woburn, and Wrestingworth.

time. Of 32 widows and widowers identified in the census of 1851, 30 of their spouses were located in Anglican burial registers between 1841 and 1851, indicating a high degree of burial registration reliability.

Twenty-six of 165 elite husbands and wives (16 per cent) died in the decade between 1841 and 1851, whereas the number amongst the 182 labourers' husbands and wives was 27 (15 per cent). This slightly higher mortality among elite families was in spite of a lower average age of husbands in 1841, and a shorter period at risk. Among wives, mortality was also higher in elite than in labourers' families: 13 out of 79 traced cases died (17 per cent) as against 10 out of 83 (12 per cent). However, the sample sizes are small, and Table 9 suggests no significant difference in overall adult mortality between elite and labourers' families in Bedfordshire at this time.

Reliable figures for a wider range of occupations were published by the Registrar-General at the end of the nineteenth century. There was little or no correlation between social group and adult mortality in 1860-61 and 1871, although the white-collar group had the lowest adult expectation of life in this period.[14]

Research carried out by the lead author and associates on civil registers of deaths linked to censuses for Ipswich in the period 1871-1910 indicates that there was little or no difference in adult mortality by socio-economic status in the period 1871-81, but that a social class gradient began to emerge at the end of the nineteenth century. Adult mortality was measured by tracking families in the two decades 1871-81 and 1891-1901, analysing the mortality of husbands and wives where at least one of them survived to be enumerated at the end of the decade. Elite families employing a domestic servant were compared to labourers' families, with a total of 500 husbands and wives being selected in sequence from the census at the beginning of the decade.

Table 10: *Percentage Mortality among Ipswich Elite and Labourer Husbands and Wives, in 1871-81 and 1891-1901 (Number of Cases in Brackets)*

Period	*Elite Husbands and Wives*		*Labourer Husband and Wives*	
	Age Group	*Mortality Rate Percentage*	*Age Group*	*Mortality Rate Percentage*
1871-81	20-44	6.4% (299)	20-44	7.9% (303)
	45-69	17.5% (194)	45-69	16.9% (183)
1891-1900	20-44	6.0% (285)	20-44	8.4% (356)
	45-69	11.8% (169)	45-69	17.7% (175)

Source: Razzell 2006a

There was little or no gradient in the 1870s but by the 1890s differences in mortality – particularly for the age group 45-69 – were beginning to emerge. In order to establish the validity of this finding, it will be necessary to analyse much larger samples from the Ipswich study, and to carry out a random study of individual families in England and Wales.[15]

The aggregative statistics for England and Wales indicate that since the beginning of the twentieth century, a social class gradient in adult mortality has been progressively established, and the socio-economic adult mortality differential has widened significantly during the last few decades.[16]

The Role of Nutrition and Physical Activity

Given that elite families were much wealthier than other members of the population, and that they had access to much better provision of food, good housing and medical care, why were their adult mortality rates the same or even higher than the rest of the population? The issue becomes even more puzzling in the light of the relatively low adult mortality among labourers and other poor groups. There is much evidence of the inadequate diet of labourers' families in the late eighteenth and early nineteenth centuries, culminating in the 'hungry forties'.[17] Chadwick and others described the insanitary quality of much of their housing, and the poverty of labourers – particularly in rural areas – has been very widely documented.[18] Recently, Bernard Harris has argued that nutrition did play a significant historical role in shaping mortality.[19] There is good evidence that extreme poverty did significantly increase mortality in certain historical periods.[20] These findings increase the puzzle of a lack of a socio-economic gradient in adult mortality before the twentieth century.

However, there is a contemporary literature on wealth and health, which stresses the hazards of wealth rather than poverty. Thomas Tryon in 1683 wrote:

> Great drinking of *Wine* and *strong Drinks* after full Meals of *Flesh* and *Fish* … do often wound the Health … which many of the richest sort of People in this Nation might know by woeful Experience, especially in London, who do yearly spend many Hundreds, (I think I may say Thousands) of Pounds on their *Ungodly Paunches* … for their *Bellies* are swollen up to their *Chins* … their *Brains* are sunk in their *Bellies; Injection* and *Ejection* is the business of their Life, and all their precious hours are spent between the *Platter* and the *Glass*, and the *Close-stool* and *Piss-pot*.[21]

Tryon stressed that it was not just eating and drinking that was responsible for obesity, but also physical inactivity, which varied not just between individuals but among different socio-economic groups:

> Suppose a man were to seek *Fat Men* and *Women,* would he go into *Country-Villages* and *poor small Towns* among *Plough-men* and *Shepherds*? … No, no, such a Man's Errand would lie in *great Cities* and *Market-Towns,* where there is store of *strong Liquors* and *Idleness*. … [among] People that live sedentary Lives, and are easie Imployment, more especially of mature Age, as *Gentlemen* and *Citizens*, etc, who use themselves to lie long in Bed in the Morning, and to great Dinners and rich Cordial Drinks.[22]

Tryon was mainly concerned with the effect of lifestyle on the health of the wealthy, and had little to say about the ordinary population. The Puritan clergyman Richard Baxter did give a detailed account of the lives of the rural poor at the end of the seventeenth century:

> For by the advantage of their labour and health, their browne bread and milk and butter and cheese and cabbages and turnips and parsnips and carrots and onions and potatoes and whey and buttermilk and pease pies and apple pies and puddings and pancakes and gruel and flummery and furmety, yea dry bread, and small drinke, do afford their appetites a pleasanter relish and their bodyes more strength and longer life than all the varieties and fullness of flesh and wines and strong drinkes do, to the idle gluttonous and voluptuous rich men.…The worst of the poore mans case as to health, is that they are put to goe through raine and wett, through thick and thin, through heat and cold and oft want that which nature needeth.[23]

Baxter understood that the poor were able to enjoy relatively good health as long as they had an adequate diet of fresh vegetables, fruit, dairy and grain products, and engaged in vigorous activity through their working life. He may have exaggerated the quality of the diet of the poor, although he acknowledged that they suffered from the ill-effects of wet and cold.

An understanding of the link between diet, drink, exercise and health had become very general by the early eighteenth century. George Cheyne established his medical reputation through the publication in 1724 of his *Essay on Health and Long Life*, which ran to nine editions, and was translated into a number of different European languages. Cheyne summarised the main argument of this work by quoting Sir Charles Scarborough's advice to the Duchess of Portsmouth: "you must eat less, or use more exercise, or take physic, or be sick".[24]

Cheyne himself had suffered from obesity which he described in his autobiography:

> Upon my coming to London, I all of a sudden changed my whole Manner of Living; I found the Bottle Companions, the younger Gentry, and Free-Livers' to be the most easy of Access. I soon became caressed by them and grew daily in bulk and friendship with these gay gentlemen … and thus constantly dining and supping … my health was in a few years brought into great distress, by so sudden and violent a change. I grew excessively fat, short-breathed, lethargic and listless … My appetite being insatiable I sucked up and retained the juices and chyle of my food like a sponge and thereby suddenly grew plump, fat, and hale to a wonder, but … every dinner necessarily became a surfeit and a debauch, and in ten or twelve years I swelled to such an enormous size that upon my last weighing I exceeded 32 stone.[25]

Although Cheyne acknowledged that his obesity was partly a family characteristic, he understood that it was also a function of his lifestyle. The pattern of consumption of food and drink by the fashionable was partly the result of economic prosperity and the importation of luxuries:

> Since our wealth has increased and our navigation has been extended we have ransacked all the parts of the globe to bring together its whole stock of materials for riot, luxury, and to provoke excess. The tables of the rich and great (and indeed those who can afford it) are furnish'd with provisions of delicacy, number, and plenty, sufficient to provoke, and even gorge, the most large and voluptuous appetite.[26]

Cheyne summarised his general conclusions as follows:

> If any man has eat or drank so much, as render him unfit for the duties and studies of his profession … he has overdone … It is amazing to think how men of voluptuousness, laziness, and poor constitutions, should imagine themselves able to carry off loads of high-seasoned foods, and inflammatory liquors, without injury or pain; when men of mechanic employments, and robust constitutions, are scarcely able to live healthy and in vigour to any great age, on a simple, low, and almost vegetable diet.[27]

Three years after Cheyne published this work, Short wrote his *Dictionary Concerning the Causes and Effects of Corpulency*, in which he concluded that "lean People generally enjoy a far greater Measure of Health" than those who were over-weight.[28]

This theme of the damaging effects of excess and obesity became commonplace in eighteenth and nineteenth century medical writings.

One of the most popular eighteenth-century books on medicine was Buchan's *Domestic Medicine* which was first published in 1769, and was frequently reprinted in new editions through to the middle of the nineteenth century. Buchan summarised his view on activity, exercise and health as follows:

> Those whom labour obliges to labour for daily bread, are not only the most healthy, but generally the most happy … Tis now below any one to walk who can afford to be carried. How ridiculous would it seem to a person unacquainted with modern luxury … to see a fat carcase, over-run with diseases occasioned by inactivity, dragged through the streets by half a dozen horses.[29]

The ill-health of the wealthy was sometimes linked to the incidence of gout, although contemporaries had a broader conception of the disease than would be the case today.[30] The awareness of the ill-effects of over-eating does not appear to have greatly influenced the behaviour of the wealthy in the eighteenth century. Parson Woodforde detailed in his diary his dietary excesses almost on a daily basis. For example, on the 14 February 1791, he wrote, "we had for Dinner Cod and Oyster Sauce, a fillet of Veal rosted, boiled Tongue, stewed Beef, Peas Soup and Mutton Stakes. 2nd Course, a rost Chicken, Cheesecakes, Jelly-Custards &.".[31]

Evidence of this sort is of course only anecdotal, and may not be typical of the gentry's and aristocracy's consumption of food at this time. However, there are general accounts that suggest that their food consumption may have been excessive. When La Rochefoucald visited England in 1784, he described the dining customs of country houses as follows:

> Dinner is one of the most wearisome of English experiences, lasting, as it does, for four or five hours. The first two are spent in eating and you are compelled to exercise your stomach to the full order to please your host. He asks you the whole time whether you like the food and presses you to eat more, with the result that, out of pure politeness, I do nothing but eat from the time that I sit down until the time when I get up from the table.… All the dishes consist of various meats either boiled or roasted and of joints weighing about twenty or thirty pounds.[32]

Fogel has estimated that the wealthiest tenth of the population consumed more than 4000 calories per adult per day at the end of the eighteenth century.[33] This is similar to Seebohm Rowntree's finding of 4,039 calories amongst the servant-keeping class in York at the end of the nineteenth century.[34] Commenting on the findings of a survey of the budgets of six of these families, Seebohm Rowntree concluded that:

> considering these six diets as a whole, it is clear that the amount of food consumed is in excess of requirements … it is doubtful whether the work done by the six families here considered is more than 'light industrial work', the food requirements … [for which are] 3000 calories of fuel energy.[35]

Seebohm Rowntree's sample was very small and there is little direct evidence of the effect of diet on obesity levels among the rich at this time. Information was collected on the weight of the wealthy and fashionable when they were weighed at Berry's wine merchants in St James's Street, London, and weight registers have survived from 1756 to the present day. This, of course, is a self-selected sample, and the

consumption of wine is likely to have increased the incidence of obesity amongst this wealthy group. Nevertheless, the information in the registers provides some useful background data, and was used by Francis Galton in his biometric research. He analysed the weights of 139 members of the aristocracy born between 1740 and 1829, and aged 27 to 70.[36] Many aristocrats had their weights taken several times a year, and Galton compiled charts of weight by age for each individual.

He divided his sample into three birth cohorts − 1740-69, 1770-99 and 1800-29 − and found that weight fluctuated much more significantly in the first cohort, concluding that "there can be no doubt that the dissolute life led by the upper classes about the beginning of [the nineteenth century] … has left its mark on their age-weight traces".[37] Although sample sizes were small, Pearson calculated mean weights for the different cohorts, and the overall average declined from 179 pounds for those born in 1740-69 to 171 pounds for those born in 1800-29.[38] The mean average of all the weights taken for the whole sample of 139 individuals is 174 pounds – 12 stone 6 pounds.

There is no information on the heights of the peerage, but there are some data on German aristocratic students aged 21 for the period 1772-96. Sixty young aristocrats had a mean average height of 168.8 cm, 6 to 7 cm less than today's equivalent.[39] Galton quoted figures of weight by age for professional men in the early 1880s, ranging from 161 pounds for 27 year-olds to 174 pounds for 60 year-olds. No heights were recorded, but there are such data on Sandhurst recruits – perhaps representative of the professional group – which indicate an average height of 68 inches for men over the age of 21 born during the middle of the nineteenth century.[40] This can be compared to data on the weight and height of contemporary working-class populations. For example, Liverpool convicts weighed an average of 143 pounds with a mean height of 66 inches during the mid-nineteenth century. [41] This indicated that working-class men were significantly leaner than their wealthy aristocratic and professional contemporaries.[42]

The association between wealth, dietary excesses, lack of exercise and ill-health continued to be documented into the nineteenth century.[43] The influence of these factors on longevity was summarised by Sinclair in 1833:

> It has been justly observed, that it is not the rich and great, nor those that depend on medicine, who attain old age, but such as use much exercise, breathe pure air, and where is food is plain and moderate.… Hence it would appear, that the situation of the middle, and even the lower classes of society, is particularly favourable to longevity.[44]

Sinclair somewhat romanticised the condition of the poor, and perhaps a more realistic account is the following description of the life of agricultural labourers at the end of the nineteenth century:

> … wages are for labourers 8s. or 9.s. a week.… In wet weather or in sickness his wages entirely cease so that he seldom makes a full week. The cottages, as a rule, are not fit to house pigs in. The labourer breakfasts on tea-kettle broth, hot water poured on bread and flavoured with onions; dines on bread and hard cheese at 2d. a pound, with cider very washy and sour, and sups on potatoes or cabbage greased with a tiny bit of fat bacon. He seldom more than sees or smells butcher's meat. He is long lived, but in the prime of life 'crippled up', i.e. disabled by rheumatism, the result of wet clothes with no fire to dry them by for the next morning, poor living and sour cider.[45]

Other descriptions of labourers' lifestyles suggest a more generous diet, although most accounts indicate that food was often in short supply.[46] Heath noted at the end of the nineteenth century the difference in stature between the farmer and agricultural labourer: "Compare the shapely forms of the young farmers with those of the stunted young labourer, and … compare the stalwart, jovial forms of the elderly farmers with the rheumatic, misshapen forms of the old labourers, and the evil result, not only of over-early work, but of a lifetime of poor and insufficient food and bad lodging, will be manifest."[47] It may be that poor diet and poverty had a stronger impact on morbidity than mortality among labourers, although as we will now see, other factors may have influenced mortality levels.

The Role of Alcohol and Tobacco Consumption

Thomas Tryon summarised the changes that had taken place in the smoking of tobacco during the seventeenth century:

> It is not above sixty or seventy years ago since that only *Gentlemen*, and but a few of those took *Tobacco,* and then so moderately, that one Pipe would serve four or five, for they handed it from one to another … but now every Plow-man has his Pipe to himself.[48]

However, he acknowledged that among ordinary working families "the Expenses which this smoking generally draws with it, have half starved their poor Families".[49] He indicated that wealth played a role in the consumption of tobacco and other luxuries:

> Are not those that live in the most Remote parts of *England,* and far from *Cities* and *Sea-Ports*, where *Money* is scarce, and such things dear, that the common People cannot buy them, most healthful and freest from Diseases? But now these *Out-landish Ingredients* begin to be so much admired, that the *good Dame, viz the Farmers Wife* will sell her *Eggs, Butter, Cheese* and *Wheat* to buy *Sugar, Spice* and *Tobacco*.[50]

More than 60 years later, Hogarth made a similar distinction between the destructive gin-drinking of Londoners and the more healthy habits of the rural poor:

> ... go into some Country Village, where that Fiery Dragon Gin has not yet spread her Poison, and you will find their Children, though in Rags, yet of a goodly and healthful Look. Their Diet indeed is coarse, but yet it's wholesome; their Drink, though better than small Beer, answers the Ends of Nutrition better than the finest Spirituous Liquors in the World.[51]

He also drew a distinction between the habits of the wealthy and the poor in the countryside:

> The Squire, who does not keep his Cellar full of the best Liquor, is but little regarded by the Farmers and Neighbours; and if the Farmer has not a Tub of the best ready breach'd, or Brandy and other Ingredients for Punch when the 'Squire is pleas'd to honour him with his own and his Friends Company, he must never expect to be invited to the noble Sport of Hunting.… And all of them are unanimously of Opinion in one Thing, that is, that they never think they make a Friend welcome unless they make him drunk.[52]

La Rochefoucald, in his account of life in English country houses, commented on the amount of alcohol consumed during dinner:

> After the sweets … the table is covered with all sorts of wine, for even gentlemen of modest means always keep a large stock of good wine. On the middle of the table there is a small quantity of fruit, a few biscuits (to stimulate thirst) and some butter, for many English people take it at dessert … One proceeds to drink − sometimes in an alarming measure. Everyone has to drink in his turn, for the bottles make a continuous circuit of the table and the host takes note that everyone is drinking in his turn.[53]

The dangers of alcohol were well known to eighteenth-century writers and artists. One of the most vivid of Rowlandson's satires was 'Death in the Bowl', showing the skeletal figure of Death drinking with a group of obese-looking gentlemen crouched over a bowl of alcohol.[54] Another of his satires showed Death wheeling an obese man away in a wheel-barrow from a tavern, outside of which two portly gentlemen and a farmer are depicted drinking and smoking tobacco, with Death telling the dead man's wife, "Drunk and alive, the man was thine, But dead & drunk, why – he is mine."[55]

There is very little systematic evidence on the consumption of alcohol by different socio-economic groups, but the cost of alcohol probably constrained the amount consumed by the poor. The budgets published by Eden, Davies and others during the eighteenth and nineteenth centuries, showed that the labouring poor bought little alcohol.[56] However, the budgets did not reveal the full story, partly because they took no account of home brewing, but also because they did not adequately measure expenditure on alcohol at taverns and public houses. Eden attempted to summarise the overall position in 1797 as follows:

> Purchased liquor is an article of expenditure particularly prevalent in the South… [although] if taxed, at any time, with drinking too much, he [the labourer] thinks it sufficient … to allege, that, excepting on a Saturday evening, or occasions of festivity, he rarely allows himself more than a pint, or at most, a pot of beer a day.… This is not the case in the North; where, besides the pure limpid stream, the general drink of the labouring classes is either whey or milk, or rather milk and water; or, at best, very meagre small beer.[57]

A hundred years later, Richard Heath came to similar conclusions. He noted the prevalence of taverns and beer-shops in rural areas, but writing about the Weald of Sussex concluded:

> … it would be a good thing if … the little beer shops would be shut up, and a vast amount of misery prevented. Not that the peasant of the Weald is a drunkard. He is far too poor for that. It is only on club days, and occasionally on Saturday night, that he gives way. Habitual drinking in the country is the vice of a class in a superior social position.[58]

Seebohm Rowntree, at the end of the nineteenth century, also found a relatively small consumption of alcohol amongst the respectable poor: "the families studied [earning under 26 shillings a week] represent the steady, respectable section of the labouring classes, who spend practically nothing upon drink".[59] However, he echoed Heath when he concluded:

> There is more drinking in Class B [the second poorest group] than in Class A [the poorest group], but this does not imply a lower moral standard. People in Class A are for the most part so absolutely destitute that they could not get much drink even if they wished. And in Class B, as we have seen … the money for drink can only be found, in the great majority of cases, by foregoing some other expenditure which is necessary for maintaining the family in a state of physical efficiency.[60]

More prosperous working-class groups did, however, consume alcohol, and Seebohm Rowntree estimated that the average expenditure on drink was six shillings a week, absorbing 'more than one-sixth of the average total family income of the working classes of York'.[61] There is plenty of evidence that alcohol was consumed in large quantities in the second half of the nineteenth century. Samuel Smiles estimated in 1875 that the working classes spent £60,000,000 on drink and tobacco.[62] As John Burnett has pointed out, "when allowance is made for the growing number of teetotallers, it means that many families must have spent a third, and some half or more, of all their income on drink".[63] A degree of prosperity was required for the consumption of drink, and growing real incomes of working-class families after the middle of the nineteenth century made this possible.

This was also true of tobacco consumption which increased significantly after the middle of the nineteenth century, and appears to have been influenced by changes in per capita income during the period 1791-1938.[64] Budgets compiled by Eden, Davies, Seebohm Rowntree and others showed virtually no consumption of tobacco in respectable working-class families, similar to the pattern of alcohol consumption.[65] Tobacco cost about three pence an ounce, and where family incomes were less than ten shillings a week, it would have been impossible for the working poor to sustain a significant consumption of tobacco over extended periods. [66]

The literary evidence indicates that wealthy men smoked tobacco fairly regularly. Smoking rooms were introduced into some country houses as early as the 1720s, and by the middle of the nineteenth century "smoking rooms had become an integral part of most gentlemen's country houses, and guests who did not appear in them for a convivial smoke or game after the ladies had retired were liable to be dragged out of bed to conform to a recognised social convention".[67] The habits of the royal family are illuminating in this respect:

> [Queen Victoria] disliked the habit intensely … Even Prince Albert had not presumed to smoke in her presence; and at Osborne House … a special smoking room was built … The queen could always detect the smell of tobacco on documents which were sent up to her; and her Assistant Private Secrertary, Frederick Ponsoby … and his colleagues took to carrying peppermints in their pockets in case a summons to the queen came at a moment when their breath was sure to offend her.[68]

The economic capacity to consume tobacco – along with an excessive consumption of food and alcohol – undoubtedly damaged the health of the wealthy. These patterns of consumption along with a lack of physical activity may have been largely responsible for the high adult mortality of the rich, a theme which can be further explored through the work of the eminent Victorian actuary, Frederick Neison.

The Work of Francis Neison

Neison was an actuary who worked for one of the leading insurance companies, and had a life-long interest in the causes of ill-health and mortality. He was sceptical about the emphasis on sanitation and poverty by his contemporaries Farr and Chadwick, and produced a range of evidence to show the importance of personal behaviour, in particular the role of physical activity and the consumption of alcohol.[69] His starting point was evidence on socio-economic status and adult mortality:

> In the year 1843, a report was made, by a committee of actuaries, on the mortality among persons assured by seventeen of the principal assurance companies of this country, and

> these persons may be fairly considered to belong to the middle and upper classes of society; and at various periods since the year 1824, inquiries have been made into the mortality rate among the members of friendly societies, including the more industrious and prudential of the working and the labouring portion of the people. One important result derived from these investigations is, that … [the] information clearly proves the mortality of the middle and upper classes to be above, and that of the industrious working classes to be below, the ratio for the country generally.[70]

In attempting to explain this unexpected finding, Neison pointed out the importance of the characteristics of members of friendly societies:

> Their incomes are very limited, affording but the scantiest and simplest means of support. Their habitations are of an inferior order, being of the cheapest kind, and consequently in the worst streets.… For an individual to remain a Member of a Friendly Society, it is required that he should make his weekly or monthly contribution to its funds; and although a few pence is all that is needed, it presumes on a certain amount of frugality and industrial habit, sufficient to separate him from the reckless and improvident, who are more openly exposed to the vicissitudes − poverty, distress, destitution and disease.[71]

Neison recognised that poverty did play a role in creating ill-health, but argued that this was largely a function of variations in individual behaviour. He also contrasted the frugality and temperate habits of friendly society members with that of the wealthy:

> … by tracing the various classes of society in which there exists sufficient means of subsistence, beginning with the most humble, and passing on to the middle and upper classes, that a gradual deterioration in the duration of life takes place … this condition would seem to flow directly from the luxurious and pampered style of living among the wealthier classes, whose artificial habits interfere with the nature and degree of those physical exercises which, in a simpler class of society, are accompanied with a long life.[72]

He provided statistical evidence in support of the thesis that physical activity and alcohol were the key factors in shaping adult mortality patterns. He analysed friendly society records and showed that clerks whose occupation required minimal physical exertion had a significantly lower expectation of life at all ages than plumbers, painters, bakers and miners. Clerks at age 20 had an expectation of life of 31.8 years, plumbers and painters 36.9 years, bakers 40.0 years, and miners 40.7 years.[73]

Neison classified occupations by amount of physical activity, and whether they were employed outdoors or indoors, and summarised his findings as follows:

Table 11: *Expectation of Life (Years) among Friendly Society Members*

Age	*Indoor Occupations with Little Exercise*	*Indoor Occupations with Great Exercise*	*Outdoor Occupations with Little Exercise*	*Outdoor Occupations with Great Exercise*
20	41.9	42.0	37.8	43.4
30	35.1	34.5	30.1	36.6
40	27.9	27.8	23.0	29.1
50	20.5	21.2	17.3	22.0
60	14.0	15.1	11.0	15.6
70	8.6	10.4	4.6	9.3

Source: Neison 1864, p. 456

The unhealthiest occupations were those carried out outdoors with little exercise, followed by indoor occupations with little or great exercise. The healthiest occupations were those involving great exercise but carried out outdoors. Table 11 suggests that working outside did carry some health penalties – presumably through the effects of cold and damp – but that outdoor occupations with much physical activity conferred significant health benefits.

Neison carried out a special survey of mortality among those with 'intemperate habits' through sending out questionnaires to insurance companies, asking for information on insured members from medical personnel. He found a very strong mortality gradient, with those having 'intemperate habits' – presumably mainly those addicted to alcohol – having much higher levels of mortality.

Table 12: *Mortality among Persons of Intemperate Habits Compared to that in England and Wales*

Age	*Number Exposed to Risk*	*Died*	*Mortality Per Cent*	*England and Wales Mortality Per Cent*	*Proportion of Intemperance Mortality to that of England and Wales*
16-20	74.5	1	1.342	.730	1.8
21-30	949.0	47	4.953	.974	5.1
31-40	1861.0	86	4.620	1.110	4.2
41-50	1635.5	98	5.992	1.452	4.1
51-60	966.0	62	6.418	2.254	2.9
61-70	500.5	40	7.992	4.259	1.9
71-80	110.0	20	18.182	9.097	2.0
81-90	15.0	2	20.000	19.904	1.0

Source: Neison 1864, p. 204

There are problems with the interpretation of Table 12 – the nature of the sample, its socio-economic and geographical composition – but its findings are plausible: those who drank large quantities of alcohol – and probably smoked tobacco – suffered levels of mortality in some age groups four or five times higher than the general population.

Neison assumed that he had largely refuted the arguments of Farr, Chadwick and other sanitarians, but there is no inconsistency between the importance of disease environment on the one hand, and the role of lifestyle on the other. There is evidence

for the importance of both, and the relative role of these variables will depend upon particular historical and social circumstances.[74]

Wealth and Mortality among Women

The small amount of available evidence on female adult mortality is ambiguous before the twentieth century. Tryon claimed at the end of the seventeenth century that women's health suffered because of their lifestyle:

> … there being hardly any Women in the known-World that are such great Drinkers and lovers of strong liquors as the *English* ... the too frequent drinking of *Wine* and *strong Drinks,* which … makes her lose her way … [and the] Inconveniences the Mother suffers, the Child partakes thereof, both in the time of Pregnancy (or breeding) and whilst it sucks.[75]

He claimed that wealthy women were less healthy than the poor, resulting from their physical inactivity:

> Women ought *not to lie too long in* Bed, as most of them that are of any Quality or Ability do … if they do but use any kind of Exercises, and hereby their Travail in Child-bearing is tenfold more burthensom than otherwise it would be, witness many ordinary Country People, who have nothing the trouble such times as our *fine lazy sluggabed Dames.*[76]

There is no systematic evidence on lifestyle of women in wealthy families. Certainly many of the fashionable women depicted in contemporary pictorial satires were depicted as obese and over-weight.[77] Both Pepys and Parson Woodforde describe in their diaries female guests consuming very generous quantities of food and drink.[78] Woodforde also makes reference to female alcoholics of his acquaintance.[79] Dobson quotes Dr George Buxton's diary for the year 1770, in which "he claimed to have seen many women die miserably" of alcoholism.[80]

Gronow, writing in the Regency period, described how women along with men consumed large quantities of food and alcohol during dinner parties:

> … a perpetual thirst seemed to come over people, both men and women, as soon as they had tasted their soup; as from that moment everybody was taking wine with everybody else, till the close of the dinner; and such wine that produces that class of Cordiality which frequently wanders into stupefaction. How all this eating and drinking ended was obvious, from the prevalence of gout, and the necessity of every one making the pill-box their constant bedroom companion.[81]

Irvine Loudon has presented evidence to show that maternal mortality was as high or even higher among middle-class as it was working-class mothers during the nineteenth and early twentieth centuries, and this was probably partly due to the delivery of babies by medical practitioners with inadequate obstetric practices. [82] Judith Lewis has argued that there were similar problems with the treatment of pregnant aristocratic women, although her research indicates that only about five per cent of women in peerage families died in childbirth in the period before the mid-nineteenth century, similar to estimated levels in the general population.[83] However, there was a marked drop in maternal mortality among aristocratic women in the nineteenth century, much more rapid and significant than that which occurred amongst the general population, which may have been linked to the development of the anti-sepsis movement in the mid-nineteenth century.[84]

Conclusion

The research reviewed in this paper suggests that lifestyle – an excessive consumption of food, alcohol and tobacco, and lack of physical activity – may have been primarily responsible for the high adult mortality of wealthy men. However, there are still a number of unresolved issues and the role of nutrition and poverty in shaping adult mortality still requires further clarification. A more detailed analysis of adult mortality by occupational group would partly help achieve this aim. The method of calculating mortality by tracking married couples between censuses, used with the Bedfordshire sample, is possible for all parts of England with surviving census schedules and parish registers. For example, a comparison between farmers and agricultural labourers for individual parishes would further clarify the role of poverty in determining mortality. Evidence quoted earlier in Table 4 and from late nineteenth-century national censuses indicates that there was no significant difference in mortality between these two occupational groups.[85] We have seen earlier that the life-long poverty of labourers led to physical stunting compared to farmers. It is possible that the effects of poverty among labourers were counter-balanced by the hazards of wealth among farmers – the consumption of alcohol, tobacco and an excess of food. Both groups lived in rural areas and led physically active lives, and explanations of their mortality patterns will require further research into other aspects of lifestyle and cause of death.

The overall evidence considered in this paper provides only minimal support to Wilkinson and Marmot's thesis that social inequality *per se* leads to higher mortality in adults. The absence of a social-class gradient in this type of mortality before the twentieth century indicates that other factors were more significant. We have suggested that lifestyle – excessive consumption of food, alcohol and tobacco, and a lack of physical activity – was central to high adult mortality among wealthy men and women. The data reviewed suggest that there were significant health hazards attached to the ownership of wealth, but given the provisional nature of the evidence, much further research is going to be required before the complex relationship between wealth and mortality can be fully resolved.

Acknowledgements
We would like to thank the Wellcome Trust and the Economic and Social Research Council for funding the research on which the findings are based, and Bernard Harris, Robin Haines and the two anonymous referees for comments on the paper.

Bibliography

Primary sources

Banting, W. 1864, *Letter on Corpulence, Addressed to the Public*, London.
Beresford, J. (ed.) 1999, *James Woodforde: The Diary of a Country Parson*, Norwich: Canterbury Press.
Blagg, T. M. (ed.) 1946-47, *Abstracts of the Bonds and Allegations for Nottinghamshire Marriage Licences*, Thoroton Society Record Series, 10, Nottingham.
Buchan, W. 1769, *Domestic Medicine; Or the Family Physician*, Edinburgh.

Chadwick, E. 1965, *Report on the Sanitary Condition of the Labouring Population of Great Britain, 1842*, ed. and intro. M. W. Flinn, Edinburgh: Edinburgh University Press.
Cheyne, G. 1823, *Practical Rules for the Restoration and Preservation of Health and the Best Means for Invigorating and Prolonging Life*, London.
Combe, W. 1815, *The English Dance of Death*, London.
Danson, J. T. 1862, 'Statistical Observations Relative to the Growth of the Human Body (Males) in Height and Weight, from Eighteen to Thirty Years of Age, as Illustrated by the Records of the Borough Gaol of Liverpool', *Journal of the Statistical Society of London*, 23, 20-4.
Davies, D. 1796, *The Case of Labourers in Husbandry*, Dublin.
Eden, F. M. 1797, *The State of the Poor*, *or, an History of the Labouring Classes in England from the Conquest to the Present Period*, 1, London.
General Register Office, Annual Reports.
Galton, F. 1884, 'The Weights of British Noblemen during the last Three Generations', *Nature*, 17, 266-8.
Heath, R. 1893, *The English Peasant*, London: T. Fisher Unwin.
Hogarth, W. 1751, *A Dissertation on Mr Hogarth's Six Prints Lately Published, Viz Gin Law, Beer Street, and the Four Stages of Cruelty*, London.
Hutcheson Bailey, A. and A. Day 1863, 'On the Rate of Mortality prevailing amongst Families of the Peerage during the Nineteenth Century', *Journal of the Statistical Society*, 24, 49-69.
La Rochefoucald, F. 1995, *A Frenchman in England in 1784*, London: Caliban Books.
Latham, R. C. and W. Matthews (eds) 1995, *The Diary of Samuel Pepys*, 11 Volumes, London: Harper Collins.
Neild, W. 1841, 'Comparative Statement of the Income and Expenditure of Certain Families of the Working Classes in Manchester and Dukinfield in the years 1836 and 1841', *Journal of the Statistical Society of London*, 4, 320-34.
Neison, F. G. P. 1864, *Contributions to Vital Statistics*, London.
Penfold, E. W. D. (ed.) 1917 and 1919, *Calendar of Sussex Marriage Licences … for the Archdeaconary of Lewes, 1772-1837*, Sussex Record Society, 25 and 26.
Porter, R. (ed.) 1991, *George Cheyne: The English Malady, 1733*, London: Routledge.
Powicke, F. J. (ed.) 1926, *Richard Baxter's the Poor Husbandman's Advocate to Rich Racking Landlords*, London: Manchester.
Short, T. 1727, *A Dictionary Concerning the Causes and Effects of Corpulency*, London.
Sinclair, J. 1833, *The Code of Health and Longevity*, London.
Smiles, S. 1905, *Thrift*, London: Murray.
Tryon, T. 1683, *The Way to Health, Long Life and Happiness*, London.
Wadd, W. 1829, *Comments on Corpulency*, London.

Secondary sources

Black, W. 1973, *An Arithmetical and Medical Analysis of the Diseases and Mortality of the Human Species*, London: Gregg.
Burnett, J. 1968, *Plenty and Want: A Social History of Diet in England from 1815 to the Present Day*, London: Penguin.
Chambers, J. D. 1965, 'The Course of Population Change', in D. V. Glass and D. E. C. Eversley (eds), *Population in History: Essays in Historical Demography*, London: Edward Arnold, 327-34.

Davey Smith, G., D. Dorling and M. Shaw (eds) 2001, *Poverty, Inequality and Health in Britain, 1800-2000: A Reader*, Bristol: Policy.
Dobson, M. 1997, *Contours of Death and Disease in Early Modern England*, Cambridge: Cambridge University Press.
Floud, R., K. Wachter and A. Gregory 1991, *Height, Health and History: Nutritional status in the United Kingdom, 1750-1980*, Cambridge: Cambridge University Press.
Fogel, R. 1992, 'Second Thoughts on the European Escape from Hunger: Famines, Price Elasticities, Entitlements, Chronic Malnutrition and Mortality Rates', in S. R. Osmani (ed.), *Nutrition and Poverty*, Oxford: Clarendon Press, 243-86.
Fogel, R. 2004, *The Escape from Hunger and Premature Death, 1700-2100: Europe, America and the Third World*, Cambridge: Cambridge University Press.
Garrett, E., A. Reid, S. Szreter, K. Schurer 2001, *As Others Do Around Us: Place, Class and Demography in England and Wales, 1891-1911*, Cambridge: Cambridge University Press.
Harris, B. 2004, 'Public Health, Nutrition, and the Decline of Mortality: The Mackeown Thesis Revisited', *Social History of Medicine*, 17, 379-407.
Hibbert, C. 1987, *The English: A Social History, 1066-1945*, London: Grafton.
Hollingsworth, T. H. 1972, *The Demography of the British Peerage*, Supplement to *Population Studies*, No. 2.
Lewis, J. 1998, '"Tis a Misfortune to Be a Great Ladie": Maternal Mortality in the British Aristocracy, 1559-1959', *Journal of British Studies*, 37, 26-53.
Loudon, I. 1992, *Death in Childbirth: An International Study of Maternal Care and Maternal Mortality, 1800-1950*, Oxford: Clarendon Press.
Lunn, P. G. 1991, 'Nutrition, Immunity and Infection', in R. Schofield, D. Reher and A. Bideau (eds), *The Decline of Mortality in Europe*, Oxford: Clarendon Press, 131-45.
Macleod, D. (ed.) 1926 and 1929, *Calendar of Sussex Marriage Licences*, Sussex Record Society, 32 and 35.
Marmot, M. 2004, *Status Syndrome*: *How your Social Standing Directly Affects your Health*, London: Bloomsbury.
Mitchell, B. R. and P. Deane 1971, *Abstract of British Historical Statistics*, Cambridge: Cambridge University Press.
Murray, V. 1998, *High Society: A Social History of the Regency Period, 1788-1830*, London: Viking.
Oppe, A. P. 1923, *Thomas Rowlandson: His Drawings and Water-colours*, London: Studio.
Rashad, H., R. Gray and T. Boerma 1995, *Evaluation of the Impact of Health Interventions*, International Union for the Scientific Study of Population, Belgium.
Razzell, P. E. 1994, *Essays in English Population History*, London: Caliban Books.
Razzell, P. E. 2003, *The Conquest of Smallpox*, London: Caliban Books.
Razzell, P. E. 2006a, *The Sociological Study of Fertility and Mortality In Ipswich, 1872-1910*.
Razzell, P. E. 2006b, *Essays in English Historical Demography*, London: Caliban Books.
Razzell, P. E. and R. W. Wainwright 1973, *The Victorian Working Class: Selections from Letters to the Morning Chronicle*, London: Frank Cass.
Razzell, P. E. and C. Spence 2004, 'Poverty or Disease Environment: The History of Mortality in Britain, 1500-1950', in M. Breschi and L. Pozzi (eds), *The Determinants of Infant and Child Mortality in Past European Populations*, Udine: Forum, 43-66.

Riley, J. C. 2001, *Rising Life Expectancy: A Global History*, Cambridge: Cambridge University Press.
Seebohm Rowntree, B. 1901, *Poverty: A Study of Town Life*, London: Macmillan.
Shaw, L. M. (ed.) 1987, *Nottinghamshire Marriage Bonds, 1791-1800*, Nottingham: University of Nottingham.
Tanner, J. M. 1981, *A History Of The Study Of Human Growth*, Cambridge: Cambridge University Press.
Wilkinson, R. G. 1989, 'Class Mortality Differentials, Income Distribution and Trends in Poverty 1921-81', *Journal of Social Policy*, 18, 307-35.
Wilkinson, R. G. 1996, *Unhealthy Societies: The Afflictions of Inequality*, London: Routledge.
Wilkinson, R. G. 1997, 'Health Inequalities: Relative or Absolute Material Standards?', *British Medical Journal,* 314, 591-5.
Woods, R. 2000, *The Demography of Victorian England and Wales*, Cambridge: Cambridge University Press.

---

[1] Wilkinson 1996; Wilkinson 1997, pp. 591-5; Marmot 2004.
[2] Davey Smith, Dorling and Shaw (eds) 2001.
[3] Ibid.*;* Harris 2004; Rashad, Gray and Boerma 1995; Lunn 1991.
[4] Razzell and Spence 2004.
[5] Razzell 2006.

[6] For a discussion of place in shaping mortality, see Garrett, Reid, Szreter, and Schurer 2001; Razzell and Spence 2004.
[7] Razzell and Spence 2004, p. 50.
[8] Razzell and Spence 2004, pp. 52-3.
[9] Woods 2000, p. 86.
[10] Razzell and Spence 2004, p. 63. The association between the occupation of fathers and level of premium paid may largely be the result of the sons of wealthy fathers being apprenticed to masters following elite occupations, such as merchants, bankers and goldsmiths.
[11] There was a significant association between region and paternal mortality levels, with the highest mortality in London and the lowest in Scotland and other regions remote from London. See Razzell and Spence, p. 51.
[12] For Chadwick's data on poverty and mortality, see Chadwick 1965, pp. 219-27. For a critique of the methodology of using age of death, see Register General, *Fifth Annual Report* 1842, pp. xxviii-xxxi.
[13] General Register Office, *Fifth Annual Report* 1842, p. 446; General Register Office, *Eighth Annual Report* 1845, pp.192-3*;* General Register Office, *Ninth Annual Report (Folio Edition)* 1846, pp. 236-8.
[14] Woods 2000, p. 234.
[15] Such research is being carried out by Kevin Schurer and associates who are studying a 2 per cent random sample of the population of England and Wales, and tracking individual families between the decadal censuses in the period 1851-1901, and linking this data with information on deaths.
[16] Wilkinson 1989, p. 308; *Independent Inquiry into Inequalities in Health: The Acheson Report*, in Davey Smith, Dorling and Shaw (eds) 1998, p. 348.
[17] Burnett 1968.

[18] Ibid.; Heath 1893; Razzell and Wainwright 1973, pp. 4-11.
[19] Harris 2004. The problem with generalisations about the role of nutrition is that some infectious diseases are known to have varied markedly in their historical virulence, and this may have changed the influence of nutrition on resulting mortality. For example, smallpox had a case-fatality of about 5 per cent in sixteenth-century London, whereas by the late nineteenth century this had risen to 45 per cent, and nutrition may have played a different role in the former compared to the latter. For evidence on changes in the fatality of smallpox, see Razzell 2003, pp. 169-78, and for the complex interaction of nutrition and infection in shaping mortality, see Lunn 1991.
[20] Davey Smith, Dorling and Shaw 2001.
[21] Tryon 1683, pp. 313-14.
[22] Tryon 1683, pp. 320, 341.
[23] Powicke 1926, pp. 22-6.
[24] Cheyne 1823, p. 64.
[25] Porter 1991, pp. 325-6, 342.
[26] Porter 1991, pp. 49-50.
[27] Cheyne 1823, p. 65.
[28] Short 1727, p. 39.
[29] Buchan 1769, pp. 100-1.
[30] See, for example, Black 1973, p. 87.
[31] Beresford 1999, pp. 262-3.
[32] La Rochefoucald 1995, pp. 29-31.
[33] Fogel 1992, p. 269.
[34] Seebohm Rowntree 1901, p. 253.
[35] Seebohm Rowntree 1901, p. 254.
[36] Galton 1884.
[37] Galton 1884, p. 267.
[38] Ibid.
[39] Tanner 1981, pp. 111-12.
[40] Floud, Wachter and Gregory 1991, p.178.
[41] Danson 1862, pp. 20-6.
[42] Most evidence points to a U-shaped relationship between body mass index and adult mortality. This suggests that both the malnourished and the over-nourished were at higher risk of mortality. See Fogel 2004, p. 24.
[43] See, for example, Wadd 1829, p.164; Banting 1864.
[44] Sinclair 1833, p. 404.
[45] Quoted in Burnett 1968, p. 166.
[46] Burnett 1968.
[47] Heath 1893, p. 129.
[48] Tryon 1683, p.168.
[49] Tryon 1683, p. 171.
[50] Tryon 1683, p. 223.
[51] Hogarth 1751, p. 32.
[52] Hogarth 1751, p. 6.
[53] La Rochefoucald 1995, pp. 29-31.
[54] Oppe 1923, Plate 44.
[55] Combe 1815, p. 97.
[56] Eden 1797; Davies 1796; Neild 1841; Seebohm Rowntree 1901.
[57] Eden 1797, p. 542.

[58] Heath 1893, p. 187.
[59] Seebohm Rowntree 1901, p. 237.
[60] Seebohm Rowntree 1901, p. 58.
[61] Seebohm Rowntree 1901, p.143.
[62] Smiles 1905, p. 114.
[63] Burnett 1968, p. 199.
[64] The annual per capita consumption of tobacco was as follows: 1791-1815: 1.11 pounds; 1816-40: 0.84 pounds; 1841-65: 1.06 pounds; 1866-90: 1.42 pounds; 1891-1915: 1.92 pounds; 1916-38: 3.13 pounds. These patterns of consumption are similar to changes in per capita income. See Mitchell and Deane 1971, pp. 343-5, 355-8.
[65] Eden 1797; Davies 1796; Neild 1841; Seebohm Rowntree 1901.
[66] Hibbert 1987, p. 559. See also the budgets quoted in Eden 1797, Davies 1796, Neild 1841, Seebohm Rowntree 1901.
[67] Hibbert 1987, p. 554.
[68] Hibbert 1987, p. 553.
[69] Neison 1864.
[70] Neison 1864, p.151.
[71] Neison 1864, p. 38.
[72] Neison 1864, p. 43.
[73] Neison 1864, pp. 54, 55.
[74] Riley 2001.
[75] Tryon 1683, pp. 278, 283-4.
[76] Tryon 1683, pp. 288-9.
[77] Oppe 1923; Murray 1998.
[78] Latham and Matthews 1995; Beresford 1999.
[79] Beresford 1999, pp. 20, 99.
[80] Dobson 1997, p. 246.
[81] Murray 1998.
[82] Loudon 1992, pp. 243-6.
[83] Lewis 1998.
[84] Lewis 1998, p. 33; Loudon 1992.
[85] General Register Office, *Supplement to the Sixty-Fifth Annual Report*, p. cxxxv.

ESRC Report: The Sociological Study Of Fertility And Mortality In Ipswich, 1872-1910 (Ref: R000239761).

BACKGROUND

It was not until the first years of the twentieth century that nationally infant mortality began a sustained decline, and while the role of the hot summers of the 1890s in maintaining high rates is now well documented, social and spatial variations at the local level, and their contribution to the lateness of the overall decline remain under-researched.[1] In recent work, on a selection of 53 census enumeration districts from the 1911 census of England and Wales, by Reid and Garrett *et al* it was demonstrated that 'environment'; the physical and social characteristics of a neighbourhood or district, had a greater impact on children's survival chances than did their social class, as defined by their father's occupation.

A second recent perspective on the underlying causes of morbidity and mortality has focused on the relationship between infant disease and subsequent adult mortality. Rose presented evidence in 1964 showing that the siblings of children dying in infancy suffered from higher rates of heart disease mortality in later life.[2] Subsequent work by Forsdahl, Buck & Simpson, Barker & Osmond, Leon & Davey Smith and others found an historical relationship between infant mortality rates and subsequent adult mortality rates from a number of diseases, including coronary heart disease, stroke, stomach cancer and diabetes.[3]

It has been widely assumed by the epidemiologists carrying out these studies that poverty and malnutrition were mainly responsible for the historical infant mortality rates quoted in their work. For example, Dorling and colleagues have recently found that the spatio-geographical distribution of poverty in London in 1896 correlates more strongly with adult disease mortality in London in 1991 than does the distribution of poverty in 1991.[4] Yet research at the Open University has indicated that there was little or no association between Booth's poverty map of the 1880s, and the incidence of infant mortality during that period.[5]

The latter finding is reflected in other research at the Open University on social class and infant mortality in the 1870s and 1880s, showing little or no correlation between class and mortality.[6] The pilot project carried out by the present applicants also demonstrated a minimal social class gradient in infant mortality in Ipswich in the 1870s.[7] There is evidence from a special study carried out at the Open University on infant mortality that the occupational gradient in infant mortality sharpened significantly during the 1880s onwards. The relationship between the social class infant mortality gradient and fertility changes is unknown, and these are central areas to be explored by the present research.

Unable to chart demographic events occurring to individual couples and their children, scholars studying the demography of the late nineteenth early twentieth century have relied for the most part on aggregate statistics published by the Registrar-General, on the published reports of the 1911 'Fertility Census' or on the demographic manipulation of 'point in time' census data. Although informative, each of these sources has major methodological drawbacks which means they provide an incomplete picture of events and do not allow the complex interplay of period and cohort variables to be fully explored.

OBJECTIVES

The project had five major objectives:

1. To create a detailed sociological and demographic database on individual families for the period 1871-1910 for the town of Ipswich by linking information from marriage, birth and death registers, and the 1871, 1881, 1891 and 1901 censuses.
2. To clarify the relationship between socio-economic status and fertility & mortality.
3. To illuminate the nature of the long-term transition in fertility and mortality that took place in Ipswich and in England between 1871 and 1910.
4. To analyse the relationship and interaction between fertility and mortality variables and how they changed over time.
5. To clarify the influence of local environment and geography on the structure of mortality, and to study patterns of geographical migration in the period between 1871 and 1910.

The first objective has largely been fulfilled, and the project has created a database which will provide a significant body of high-quality data of value to researchers for a number of years. The other four objectives have only been partly met, largely as a result of transcription problems in the first year of the project which delayed the collection of data and its eventual analysis. However, it was possible to carry out sufficient analysis to suggest certain provisional findings, which if confirmed, will significantly advance our understanding of the fertility and mortality transitions that took place in the period under consideration.

METHODS

The primary method employed in the research was nominal record linkage, linking data for individuals from census, birth and death records. Births are derived from vaccination registers which are copies of the civil birth registers, but they normally exclude information on mother's name, and include data on the names of vaccinating doctors and other additional details. The death registers were copies of the civil death register made for the local Medical Officer of Health, but again both excluding and adding information to the original civil register. Both sets of registers have been deposited in the Ipswich Record Office.

Each person enumerated in a census had been given a personal identifier (Pid) which is unique within that census and a household identifier (Sch) which is shared with others in the same household in that census. The initial digit of the Sch indicates the census to which it belongs (e.g. 7 for 1871). Linking was done by simple queries using matches between standardised fields and employing age consistency checks. The process used was similar in part to that being employed in a project using Scottish census and civil registration data and described in a forthcoming article,[8] although the more restricted content of the Ipswich birth and death registers made the linking more problematic and potentially less robust.

All nominative record linkage is vulnerable to the ever present competing risk of migration and in order to minimise this, the preliminary links are made between records close together in time.

Birth to infant death is the first type of link to be made. The vaccination register records the date of death for those children who were known to have died before being called in for vaccination, which makes linking these records a very simple first pass. Further links were found by requiring matches on the child's forename, surname and age at death and 'address' could be used for further discrimination where needed . After 1885 the death register records a child's parent, predominantly the father, so the links for deaths after that date could be based on the matching of two individuals in combination.

Child Deaths To The Preceding Census. Where possible, children in the census were assigned a 'mother's name' and a 'father's name'. The linking criteria were the same as above.

Other Deaths To The Preceding Census. After 1885 husbands are recorded for married women which allows links based on information for two individuals in combination.

Births To The Following Census. The births were grouped into families using the information given for the father. After 1881 details of the mother could often be extracted from the 'given to' data field (showing to whom the Notice of Vaccination had been given) and used in the family definition. These families are a construct that allows births with matching data, possibly a sequence of identical addresses, to be kept together even though that address might not match the one given in the later census. The survivors within the family units provide a signature age structure and name sequence that can be searched for in the subsequent censuses.

Census To Census. Similarly the information given in a census provides not just the basic fields used for identifying individuals such as names, age and birthplace, but also supplements this with extra information such as relatives' names, ages and occupations presenting a profile of the family structure that can be used to identify them in another context. Exploiting the additional information allows more confidence to be placed in the links made between the family sets and households in consecutive censuses. For example, an individual with a very common name combination who, when considered in isolation, is likely to have a plethora of possible links. Such an individual can be identified by means of a more unusual aspect of the family profile: one William Smith can be distinguished from all the others as the one whose younger brother is called Octavius or whose father was born in the United States.

The linking process is iterative and the first run will establish uncontested links where all data and relationships match perfectly. In the cases where there is a multiple set of possible links for a record, the occupations and addresses of those involved may be used to prefer one link over another. Much more time consuming are the following iterations. In these possible links are created where the data matches in all but one field. For example ages given in the two records are allowed to be inconsistent as this item of data is known to be error prone both in its reporting and transcription. Not only can surnames and forenames also be mis-spelled and mis-transcribed, but it has also become clear that individuals can use different combinations of their set of given forenames each time they appear in the records. By allowing for these inconsistencies

many more potential links can be found, but the latter have to be carefully monitored before they can be confirmed as true links. In this way the child that failed to link along with his siblings can be allowed to link despite a wildly incorrect age or even a name change from Charles E to Edward because of his relative position in the household. Similarly, women who have remarried may be recognised by the sets of children from their first marriages provided their children have kept their original surnames. With more time such links could be flagged to show any mismatch of information which had been deemed acceptable.

Once a link has been confirmed the Pid and Sch of an individual in the later census are inserted into the record of the same individual in the earlier census and vice versa. Similarly birth and death records have unique identifiers that are used to indicate links between these files and the appropriate census records. These are the keys to be used when joining the tables in the linked data bases.

The three elements of Table 1 below show that good rates of linkage have between achieved between demographic events and census entries.

Table 1: Rates Of Linkage Between Demographic Events And Census Entries.

A: Births.

Births	*Number Of Records*	*Linked To Death Before Next Census*	*Linked To Next Census*	*Percentage Accounted For*
2/4/1871 – 3/4/1881	15,294	3,075	9,290	80.8%
3/4/1881 – 5/4/1891	17,098	3,163	9,355	73.2%
5/4/1891 – 31/3/1901	17, 764	3,488	11,094	82.1%
Total 2/4/1871– 31/3/1901	**51,677**	**9,726**	**29,739**	**76.4%**

B: Deaths.

Period	*Number Of Records*	*Deaths Linked To Births*	*Deaths Linked To Previous Census*	*Percentage Of All Deaths Accounted For*	*Number Of Deaths Under 1 Year*	*Number Of Deaths Under 1 Linked To Birth*	*Percentage Of Deaths Under 1 Linked To Birth*
2/4/1871– 3/4/1881	10,188	3,077	4,668	76.0%	2,375	2,084	87.7%
3/4/1881– 5/4/1891	10,354	3,229	4,704	76.6%	2,328	2,158	92.7%
5/4/1891- 31/3/1901	11,559	3,439	4,631	70.0%	2,789	2,567	92.0%
All 2/4/1871– 31/3/1901	**32,101**	**9,745**	**14,003**	**74.0%**	**7,492**	**6,909**	**90.9%**

C: Census Population.

Period	*Number Of Records*	*Number Linked To Next Census*	*Number Dead Before Next Census*	*Percentage Accounted For*
2/4/1871	42,711	21,174	4,683	60.5%
3/4/1881	50,341	21,459	4,704	52.0%
5/4/1891	56,974	27,283	4,631	56.0%
31/3/1901	66,638	-	-	-

Overall more than 75% of births have been linked to the subsequent census, or to a death occurring before that census (reasons for the relatively low rate of linkage from 1880s births to the 1891 census are being investigated). Linkage rates of deaths to the preceding census, or to a birth occurring since the census date are only slightly lower at 74% overall. As Table 1b shows, however, certain age groups are more easily traced than others; over 90% of all infant deaths can be matched to the corresponding birth.

When linking a census entry to a subsequent census, or to a death occurring in the intervening decade, the linkage rates in Table 1c indicate that further links may well be possible. Again, certain age groups and persons in particular life-cycle stages are more difficult to identify with confidence, especially in the absence of marriage information. Single young people living outside their family home can be difficult to trace between censuses, and the tendency for elderly people to exaggerate their age as they get older can result in multiple links which are time consuming to resolve, particularly if the person reporting a death is not certain of the age of the deceased.

The crosschecking required at each iteration of the linkage becomes increasingly time consuming and the returns on effort begin to diminish. Although solitary individuals are linked the linkage process does tend to favour 'well connected' individuals who experience demographic events; a widower living alone who reports his forename and age differently in consecutive censuses is much less likely to be recognised and linked that a widower with three children remaining at home who does the same. While this bias is unproblematic for many research questions it should be borne in mind when undertaking certain analyses.

The Evaluation Of The Quality Of The Database.

In order to evaluate the quality of the database, a special study has been carried out on a sample of cases selected both for this purpose, and to provide data for an early analysis of the results of the research. The first five hundred families were selected from both the 1871 and 1891 censuses, designated hereafter as the 1871 Ipswich Sample and the 1891 Ipswich Sample. The samples were selected using the following criteria: 1. Both husband and wife were alive at the date of the census. 2. At least one of the couple was alive in the following census. 3. That families either employed a domestic servant or were headed by a husband listed in the census as a labourer. The latter criteria were adopted in order to explore the impact of differences in socio-economic status. These samples are not necessarily representative of the total population, as they were probably drawn from different districts of the town in 1871 and 1891.

The first stage of data evaluation was to compare statements of birth in the 1901 census with the register of births compiled for the period 1891-1901. Of 557 sample births that took place in Ipswich according to the 1901 census between 1891 and 1901, 546 – 98.0% – were traced in the birth register. The very high proportion of matches between census and birth registers suggests a high level of reliability of both types of data.

Additionally, nominal record research of the sort involved in the Ipswich project, assumes that for families resident in Ipswich between censuses that all demographic events will take place during the intervening decade inside the town. In order to test this assumption, the birthplaces of children aged nine and under were analysed for the 1891 Ipswich sample. According to the 1901 census, there were 5 children born outside of Ipswich in families enumerated in Ipswich in both 1891 and 1901 – representing 0.9% of the 551 total number of births. This very low proportion of external births indicates that it is not a major problem for constructing data using nominal record linkage methodology amongst those moving out and then back into the town, although this figure would not include children born and dying outside of Ipswich.

In order to evaluate the reliability of adult death registration, a search was made for the deaths of husbands and wives who were listed either in the 1871 or 1891 census, but whose partners had subsequently become widows or widowers.

Table 2: Analysis Of Traced And Untraced Adult Deaths As Indicated By Widower/Widow Status In Subsequent Censuses, 1871 And 1891 Ipswich Samples.[9]

	Traced Deaths	*Untraced Deaths*	*Total Deaths*	*% Untraced*
1871 Sample Total	108	8	116	7.4%
1891 Sample Total	93	14	107	13.1%

The proportion of untraced deaths rose from 7.4% in the 1870s to 13.1% in the 1890s. At this stage it is not clear what the reasons are for the higher proportion of untraced cases in the later decade. It is not critical for the research, partly because of the relatively low proportions of untraced cases, but also because it is possible to allow for death under-registration by including the known number of widower/'widow deaths in calculations of mortality.

One reason for untraced cases is the difficulty of accurately capturing information on names in census and registration documents, due to inaccuracies in recording and transcribing information. Handwriting in nineteenth century documents can sometimes be very difficult to decipher. These difficulties are illustrated by an analysis of changes in surname spelling in families linked in the 1871 and 1881 censuses. In the 1871 Ipswich sample there were 63 families with different surname spellings in the two censuses, as against 334 with the same spelling. These 63 cases represent a total of 15.9% of the total – 63 out of 397. The majority of the spelling variations were minor, and did not pose a major problem for the linkage of data. However, more difficult to evaluate at this stage, is the number of links which weren't made because the rendition of the surnames in different sources were so different that they were not recognised as the same name.

It is possible to trace these variations because of the large amount of contextual information on surname, names of children, address, age and occupation. It

is this information which has provided the basis of many of the successful links, in spite of variations in information on particular items.

This can be illustrated with reference to age variations. A comparison of the returned ages in the 1891 and 1901 censuses in the 1891 Ipswich sample yields the following result. Of a total of 881 cases examined, there was an exact match in 465 (52.8%), a difference of plus or minus one year in 230 (26.1%), and a variation in plus or minus two years or more in 186 (21.1%). Thus 79 per cent were accurate to within plus or minus one year, a reasonable proportion for data of this kind. However, some of the age variations within the plus or minus two year or more category were very large, and for future analysis an attempt will be made to estimate correct age from the multiple sources available.

Finally, an assessment was made of the accuracy of death registration by examining the registration of deaths for same-name cases. The same name of a dead child in the late nineteenth century was often given to a subsequent child of the same sex, allowing the measurement of the reliability of death registration through analysing the proportion of first same-name children traced in the death registers. Two of seventeen same-name children could not be located in the death register in the 1870s, and the equivalent figure for the 1890s was one out of twelve cases. The total for both samples was three out of twenty-nine same name cases not traced in the death register – 10 per cent of the total. This is perhaps not dissimilar to the proportion of missing adult deaths found in Table 2, but larger samples will be required before confident conclusions can be reached about the quality of death registration.

RESULTS

Classification Of Socio-Economic Status.

In order to illustrate the analytical possibilities of the dataset, a detailed analysis was carried out on the two samples drawn from the 1871 and 1891 censuses. These samples were chosen so as to allow an examination of the role of socio-economic status, although any findings must be subject to the caveat that the samples are not necessarily representative of the total population. In our earlier report on the pilot project covering the years 1871-81, we found little evidence of an influence of social class on fertility and infant mortality, but a measurable impact on child mortality.[10]

However, the measures of social class in the pilot project were not entirely satisfactory, due mainly to the ambiguous and difficult nature of classifying class on the basis of occupation. This difficulty has been well recognized, illustrated by the Registrar-General's allocation of clerks to the Social Class 1 category in the first attempt to classify occupational social class in the 1911 Census, subsequently relegated to Social Class 2 and Social Class 3 in later censuses. There is also the problem that about half of all occupations were allocated to Social Class 3, which precluded a precise and focused analysis of socio-economic differences.

In the pilot project report we attempted to deal with this problem by using external and objective measures – rateable value of addresses and the proportion of public/private doctors used for vaccination – but this still left a range of uncertainty and ambiguity. In the present report, information on the employment of domestic servants was available for individual families – a measure of socio-economic status used by contemporaries such as Seebohm Rowntree [11] – and we have used this data to establish socio-economic categories. We have contrasted families employing

domestic servants – which we have termed elite families – with those headed by labourers, a well-defined group known to have been one of the poorest and least educated in late nineteenth century England.[12]

We classified the elite group into two categories: 1. Families with two or more resident domestic servants (SEG1). 2. Families with only one domestic servant (SEG2). To give some idea of the nature of these categories, we list below the main occupations followed by the elite male heads of household enumerated in the two censuses combined.

Table 3: Occupations Of Head Of Households In SEG1 And SEG2 Families, 1871 and 1891 Ipswich Samples.

SEG1 Occupations	*Number Of Cases*
Attorney & Solicitor	10
Doctors & Surgeons	13
Hotel/ Innkeepers	13
Manufacturers	8
Merchants	23
Others	62
Total	132
SEG2 Occupations	*Number Of Cases*
Attorney & Solicitor	5
Baker & Confectioner	8
Builders	6
Butchers	16
Clerks	31
Commercial Travellers	19
Drapers & Tailors	19
Grocers	10
Independent/ Property Owners	6
Manufacturers	17
Merchants	16
Musicians/Piano Tuners	5
Printers	6
Others	180
Total	344

Socio-Economic Group 1 (SEG1) was mainly made up of professionals and business occupations, whereas although Group 2 (SEG2) included some of these occupations, it was mainly made up of clerks, commercial travellers, artisans and tradesmen. SEG1 appears to have been significantly more stable in its status characteristics than SEG2, as revealed in the following table.

Table 4: Continuities In The Employment Of Servants In Families, Ipswich 1871 And 1891 Samples.

SEG 1 Families 1871				*SEG 2 Families 1871*			
No Servants In 1881	1 Servant In 1881	2+ Servants In 1881	Total	No Servants In 1881	1 Servant In 1881	2+ Servants In 1881	Total
5 (6.7%)	13 (17.3%)	57 (76.0%)	75	73 (42.4%)	80 (46.5%)	19 (11.0%)	172
SEG 1 Families In 1891				*SEG 2 Families In 1891*			
No Servants In 1901	1 Servant In 1901	2+ Servants In 1901	Total	No Servants In 1901	1 Servant In 1901	2+ Servants In 1901	Total
6 (10.5%)	16 (28.0%)	35 (61.4%)	57	96 (55.8%)	61 (35.5%)	15 (8.7%)	172

Only between 6.7 and 10.5 per cent of SEG1 families had no servants ten years after they were initially enumerated, whereas the equivalent figure for SEG2 families was 42.4 to 55.8 per cent. Many of the SEG2 families without servants in subsequent censuses appear to have been artisans and tradesmen rather than professional or business people, suggesting that a more refined classification of socio-economic status will be possible in future by combining information on servants at different stages in the life cycle.

Although there were differences in the continuity of employment of servants between SEG1 and SEG2, they appear to have shared rather than differed in other socio-economic characteristics. We showed in the pilot project report that employment of public/ private vaccinators was linked to social class, as well as other measures such as rateable value. (The names of doctors used in vaccination are listed in the vaccination register, including that of the public vaccinator). The following table analyses the use of public/private vaccinators in elite compared to labourers' families in the 1871 sample, with the latter divided between non-agricultural labourers (SEG3) and agricultural labourers (SEG4).

Table 5: Private/ Public Vaccinators Used By Families 1871-81, Ipswich 1871 Sample Analysed By Socio-Economic Group

Socio-Economic Group	All Vaccinations Private	Mixed Private/ Public Vaccinations	All Vaccinations Public	Total Number Of Families
1	21 (78%)	2 (7%)	4(15%)	27
2	58 (78%)	8 (11%)	8 (11%)	74
3	6 (8%)	9 (12%)	62 (81%)	77
4	1 (6%)	1 (6%)	14 (88%)	16
1 &2	79 (78%)	10 (10%)	12 (12%)	103
3 & 4	7 (8%)	10 (11%)	76 (85%)	89

Although the numbers are small, the table indicates that SEG1 and SEG2 both employed the same number of private doctors for the vaccination of their children – 78 per cent – compared to the 8 to 6 per cent used by SEG 3 and SEG4.

Finally, a fragment of evidence on living in the local workhouse ten years after first census enumeration, illustrates the poverty of labourers' families compared to those employing domestic servants: none of the latter group finished up as paupers, whereas six husbands and wives of labourers from the 1871 sample suffered that fate, and four from the 1891 sample experienced a similar fall into absolute poverty.

The Relationship Between Socio-Economic Status And Patterns Of Residence, Fertility And Mortality.

A study was carried out of the residential stability of elite and labourers' families contained in the complete database, preparatory to an analysis of their fertility and mortality patterns in the specially selected samples.[13]

Table 6: Disappearance Of Families In Ipswich Between 1871 And 1881.

Elite Families			*Labourers Families*		
Numbers Resident In 1871	Both Husbands & Wives Absent In 1881	Proportion Disappearing	Numbers Resident In 1871	Both Husbands & Wives Absent In 1881	Proportion Disappearing
1158	218	18.8%	648	112	17.3%

Slightly more elite than labourers' families – 18.8 per cent as against 17.3 per cent – disappeared from Ipswich between 1871 and 1881, suggesting that socio-economic status did not significantly influence patterns of external migration at least in these two groups. Other groups may have been more mobile, and this can only be established through further research on the database. The linking of data in the project was mainly carried out on non-migrant families, and the relatively low amount of movement out of Ipswich, and the absence of an association between socio-economic status and migration, suggests that migration does not pose a major problem for nominal record linkage for individual decades, although cumulative migration could constitute a much more serious problem. An analysis was also carried out on stability of street residence, in order to clarify identifying patterns of address and variations in disease environment.

Table 7: Changes In Street Residence Between 1871 and 1881, Ipswich 1871 Sample By Socio-Economic Group (Numbers With Percentages In Brackets)

Socio-Economic Category	*Same Street Address*	*Different Street Address*	*Total Number Of Families*
1	39 (53%)	34 (47%)	73
2	74 (43%)	99 (57%)	173
3	77 (38%)	126 (62%)	203
4	12 (32%)	25 (68%)	37

Table 7 indicates that the higher the socio-economic status, the greater degree of residential stability. Elite families moved less frequently than labourers' families, and were exposed to fewer residential disease environments in the 1870s.

This difference of disease environment appears to have had little influence on patterns of mortality during this period. There was little socio-economic variation in adult mortality in the sample selected from the 1871 census, but this appears to have changed in the sample derived from the 1891 census.[14]

Table 8: Adult Mortality In 1871 And 1891 Ipswich Sample Families (Husband & Wife), 1871-81 and 1891-1901.

		Elite Husbands & Wives			Labourers Husbands & Wives		
Period	Age Group	Number At Risk	Number Of Deaths	% Mortality	Number At Risk	Number Of Deaths	% Mortality
1871-1881	20-44	297	19	6.4%	302	24	7.9%
	45-69	195	34	17.4%	184	31	16.8%
	Total	492	53	10.8%	486	55	11.3%
1891-1901	20-44	284	17	6.0%	356	30	8.4%
	45-69	169	20	11.8%	175	31	17.7%
	Total	453	37	8.2%	536	61	11.4%

Table 8 was compiled by tracking husbands and wives between censuses, and was restricted to couples where at least one of them was still present and alive in Ipswich ten years later. The figures are not therefore 'true' mortality rates as they exclude husbands and wives who had both died between censuses. Also, the age groups are very broad as a result of the relatively small sample sizes, and the growth of a socio-economic gradient in adult mortality at the end of the nineteenth century will have to be assessed in detail through further research on the database.

There is only limited data currently available on socio-economic status and fertility, but the evidence suggests that again significant changes took place in the last three decades of the nineteenth century. The following table summarizes data on the fertility of sample mothers listed in the 1871 and 1891 censuses, and enumerated in the following decadal census.

Table 9: Mean Number Of Children Born Between Censuses By Enumerated Age And Socio-Economic Group, 1871 And 1891 Ipswich Samples (Number Of Mothers In Brackets).[15]

Period	*Age Group*	*SEG 1*	*SEG 2*	*SEG 1 & 2*	*SEG 3*	*SEG 4*	*SEG 3 & 4*
1871-1881	20-24	5.5 (4)	5.1 (8)	5.3 (12)	3.9 (15)	3.3 (3)	3.8 (18)
	25-29	4.8 (9)	3.1 (27)	3.6 (36)	2.9 (25)	3.7 (3)	2.9 (28)
	30-34	3.5 (8)	2.7 (23)	2.9 (31)	1.7 (29)	2.3 (3)	1.8 (32)
	35-39	1.4 (11)	1.2 (26)	1.2 (37)	1.3 (24)	0.8 (12)	1.2 (36)
	40-44	0 (10)	0.2 (19)	0.1 (29)	0.3 (22)	0.5 (2)	0.3 (24)
	Total	2.6 (42)	2.1 (103)	2.3 (145)	1.9 (115)	1.7 (23)	1.9 (138)
1891-1901	20-24	2.8 (5)	2.6 (7)	2.7 (12)	3.7 (12)	4.0 (1)	3.7 (13)
	25-29	2.0 (5)	2.5 (15)	2.4 (20)	2.9 (38)	5.7 (3)	3.1 (41)
	30-34	2.0 (13)	1.5 (32)	1.6 (45)	2.4 (37)	2.0 (3)	2.3 (40)
	35-39	0.7 (6)	1.0 (23)	0.9 (29)	1.8 (34)	3.0 (2)	1.8 (36)
	40-44	0.2 (12)	0.2 (17)	0.2 (29)	0.4 (27)	1.0 (2)	0.4 (29)
	Total	1.4 (41)	1.4 (94)	1.4 (135)	2.1 (148)	3.2 (11)	2.2 (159)

Although the sample sizes are small, Table 9 indicates that fertility was higher amongst elite than labourers' families in the 1870s, a difference that had reversed by the 1890s. In the period 1871-81 the mean number of children born to elite families (SEG1 and SEG2) was 2.3 children, an average that had fallen to 1.4 by 1891-1901. The equivalent figures for labourers' families (SEG3 and SEG 4) were 1.9 children in 1871-81, increasing slightly to 2.1 by 1891-1901. This evidence reveals previously unexplored patterns of fertility – for example, that labourers were having children far more slowly than the elite in 1871-81, but not in 1891-1901. However, these patterns will have to be examined in much greater detail through an analysis of the whole database, where information is available on much larger samples.[16]

The pattern of association between socio-economic status and child mortality appears to have been similar to that of adult mortality in Ipswich at the end of the nineteenth century. The following table summarizes evidence based on the tracking of births in the two decades under observation, and is based on families present in both censuses at the beginning and end of the decade.

Table 10: Cohort Infant And Child Mortality In The 1871 And 1891 Ipswich Samples, 1871-1881 & 1891-1901.[17]

Period	*Age (Years)*	*Elite Families*			*Labourers Families*		
		Number At Risk	*Number Dying*	*Proportion Dying*	*Number At Risk*	*Number Dying*	*Proportion Dying*
1871-1881							
	0	343	48	14.0%	267	30	11.2%
	1-4	206	13	6.3%	159	15	9.4%
1891-1901							
	0	193	19	9.8%	349	40	11.5%
	1-4	157	4	2.5%	262	23	8.8%

There was little variation in overall mortality in children aged 0-4 between the different socio-economic groups in the 1870s, but a strong gradient had emerged by the end of century. Infant mortality was higher in the elite than the labourers group in 1871-81, perhaps compensated by slightly lower child mortality in the 1-4 age category, although cumulative mortality between birth and aged four was very similar in the two groups. There was subsequently a significant fall in both infant and child mortality in elite families, but virtually no change in these forms of mortality amongst labourers in the period between the 1870s and 1890s.

We found in our pilot research little association between social class and infant mortality in the period 1871-81, but a significant class gradient in child mortality for the age group 1-4 years. This discrepancy in findings may be partly a function of using socio-economic status in our current analysis and social class in the earlier research, as well as differences in sample sizes.

Information on cause of death helps clarify the patterns of mortality amongst elite and labourers' families, although the classification of cause of death is subject to ambiguity and uncertainty.

Table 11: Cause Of Infant Death In Elite And Labourers Families,1871 And 1891 Ipswich Samples.

	Elite Families		*Labourers Families*	
Cause Of Death In Infants Dying Under One Year	*Number Of Deaths (Deaths As A Proportion Of Total Births In Brackets)*		*Number Of Deaths (Deaths As A Proportion Of Total Births In Brackets)*	
	Period	*Period*	*Period*	*Period*
	1871-81	*1891-1901*	*1871-81*	*1891-1901*
Asthenia	2 (1.4%)	0 (0%)	3 (2.2%)	0 (0%)
Atrophy	2 (1.4%)	0 (0%)	1 (0.7%)	0 (0%)
Bronchitis	2 (1.4%)	1 (0.7%)	1 (0.7%)	7 (4.4%)
Convulsions	2 (1.4%)	1 (0.7%)	1 (0.7%)	6 (3.8%)
Debility	14 (9.7%)	2 (1.5%)	2 (1.5%)	0 (0%)
Diarrhoea	6 (4.1%)	6 (4.4%)	3 (2.2%)	8 (5.0%)
Marasmus	1 (0.7%)	0 (0%)	3 (2.2%)	7 (4.4%)
Measles	1 (0.7%)	0 (0%)	1 (0.7%)	0 (0%)
Mouth And Throat	3 (2.1%)	0 (0%)	0 (0%)	0 (0%)
Pneumonia	3 (2.1%)	3 (2.2%)	5 (3.6%)	3 (1.9%)
Premature Birth	2 (1.4%)	2 (1.5%)	5 (3.6%)	2 (1.3%)
Respiratory	3 (2.1%)	0 (0%)	1 (0.7%)	0 (0%)
Syphilis	0 (0%)	0 (0%)	1 (0.7%)	1 (0.6%)
Tuberculosis	0 (0%)	1 (0.7%)	0 (0%)	2 (1.3%)
Whooping Cough	3 (2.1%)	2 (1.5%)	0 (0%)	3 (1.9%)
All Others	4 (2.8%)	1 (0.7%)	3 (2.2%)	2 (1.3%)
Total Births	*145*	*135*	*138*	*159*

A large part of the decline in infant mortality amongst elite families appears to have been linked to a reduction in deaths due to debility, much which occurred during the neonatal period. This may have possibly been associated with a decline in fertility and an increase in breastfeeding in middle class families. However, diarrhoea continued to be an important cause of death amongst elite families in the 1890s. Labourers' families appear to have suffered from an increase in the incidence of bronchitis, convulsions (probably related to diarrhoea), diarrhoea, marasmus and whooping cough.

Mortality amongst servant-keeping families probably also declined amongst children aged 1-4 as well as amongst adults, and fragments of evidence suggest that much of the latter decline was due to a reduction in deaths from respiratory diseases, tuberculosis, pneumonia and bronchitis. However, only much larger samples will allow confident conclusions about changing disease patterns among the different socio-economic groups.

ACTIVITIES

The early findings from the research have been incorporated into two forthcoming articles: 1. "The hazards of wealth: adult mortality in England before the twentieth century", *Social History of Medicine* (By Peter Razzell and Christine Spence, Forthcoming 2006). 2. "Population, Poverty and Wealth: The History of Mortality and

Fertility in England, 1550-1900.", in Peter Razzell, *Essays in English Historical Demography* (Forthcoming 2006). There are also a number of articles planned on socio-economic status, geographical environment, fertility and mortality to be published in 2007, as well as a book to be published in 2008.

Some of the early findings were presented at the following conferences and seminars: 1. European Social Science History Conference held in Amsterdam on the 24th March 2006. 2. Local Population Studies Society annual conference in St. Albans on the 8th April 2006. 3. Bedfordshire Family History Society seminar on the 5th May 2006. 4. The London School of Hygiene's Population Unit's seminar on the 23rd May 2006. Further findings will be presented to the International Conference of Family Historians to be held in Northampton in September 2006, as well as other conferences in 2007 and 2008.

OUPUTS

The major output to date is the dataset, which has three elements. The first comprises files containing the transcripts of the original data from the census enumerators' books of the Registration District of Ipswich 1871-1901 and from the Ipswich vaccination birth and death registers 1871-1910.

The second element of the database contains Excel data-files created from the transcripts, and the third, an Access relational database where links are shown between individuals and households in the various data-files. Regrettably, the project experienced considerable slippage in the delivery of the data to the staff contracted to undertake the record linkage (See Table 12).

Table 12: Delivery Of Data For Ipswich Project.

Period And Data Type	*Delivery Date Expected*	*Delivery Date Bulk Received*	*Omissions Received*
1871 Census	March 2003	March 2003	December 2004
1881-91 Births	March 2003	March 2003	November 2004
1881-91 Deaths	March 2003	August 2004	November 2004
1891 Census	March 2003	August 2004	October 2004
1891-1901 Births	January 2004	June 2005	
1901 Census	January 2004	June 2005	
1901-10 Births		November 2005	
1901-10 Deaths		November 2005	

There were also problems with the quality of some data in the early stages of the research. This was due to difficulties with recruiting qualified transcribers in the first few months of the project, as well as the absence of a data editor working in Ipswich. These difficulties were resolved in the second year of the research by establishing a team of high quality transcribers – mainly recruited from the local record office – and appointing one of the transcribers (Mr David Feakes) to supervise both the day-to-day gathering of data, and the resolution of problems in the identification and capture of missing data.

Summary Of Cleaning And Coding.

* Files were merged and columns harmonised.
* Individuals and households had unique identifiers assigned, which meant that household schedule numbers and their enumeration district of origin had to established, checked and verified.
* Columns containing multiple data items (for example, the forename column and the 'Given to' column) had to be deconstructed and the individual items extracted, which was a particularly time consuming task.
* The following fields were standardised:

Age. The 'key' files show the system used to standardise names.

Surnames and forenames. Preliminary work showed that coding with Double Metaphone program alone was inadequate for our purposes as it tended to over-group the names, erroneously amalgamating some large name sets, such as Bell and Bailey and Reid and Wright. The codes were therefore used to create a manual but more discerning name dictionary.

Cause of death. The causes of death in the death file have been standardised very roughly. In the time available it was impossible to streamline the spelling and pull out the individual causes of death listed. Consequently the MO's classification entered on the later death files from the 1890s has been used as the basis of a classification system which should be viewed very much as a starting point for further work. Certain causes of death were placed in special categories separate from this classification as they had particular relevance to the themes of fertility and infant mortality (e.g. deaths which were noted as in some way related to childbirth were placed in a 'parturition' category). Again the categories devised may be discerned by cross-tabulating the 'original' data column against the 'standardised' column.

Birth Places. In some census files these have been disaggregated into the parish and county of birth, and then these elements standardised.

Addresses. In several files these have been disaggregated into their separate elements, but only in the death file have street names been fully standardised.

The approximately 200 'transcription' files delivered have been placed on the data CD in folders; one for each census, one for births and one for deaths. From these 7 'data files' were created: 1871 census, 1891 census, 1901 census East, 1901 census West, and 2 Birth files and a Death file. (Where two files exist this is because in combination they exceeded Excel's limit of 65,000 lines.) An eighth data file was derived from the 1881 census file compiled by the Church of the Latter Day Saints and enhanced by staff at the UK Data Archive, University of Essex where it is held (Ref. Number: SN 4177).

As far as possible, the data-files contain consistent columns. In each of the data-files several fields have been standardised. In some cases this was problematic as the form or content of the fields changed over time. There are 2 'key' files supplied on the data CD explaining the content of the data fields, and indicating which fields are available in each file. Some of the data (e.g. dates) have been provided in a variety of forms so that they can be used in different ways depending on the questions one is

asking. Many of the columns have also been standardised (e.g. age has been made fully numeric), but all original fields have been retained so that the mapping of the standardisation is transparent.

Each record in a file contains unique key identifiers which allows it to be matched to the linked files, and the information is given to allow every record to be located in the original 'transcription' files so that the 'data file' version can be checked against the transcription received.

The great variety of ways in which address information was given, both in the original sources and in the transcription files meant that there was insufficient time to standardise the street information across all files. Only on the death file are street names available in standardised form. The record of each individual in all the census files has had the parish in which that individual was enumerated entered on it. Parishes can make useful units for geographical analysis, although it should be noted that some streets run through more than one parish, and more than one parish contains a 'Church Lane' so some demographic events cannot be reliably assigned to a parish.

Had time permitted occupations would have been cleaned, standardised and then classified into social classes, or occupational groups, as has been done at the Data Archive for the 1881 census material.

The data-files presented on the accompanying CD were used as the basis for linkage, although not all the data fields were used. Linkage was restricted to census records and those births and deaths occurring between census day 1871 and census day 1901. The total number of records transcribed and the number of records available to the linkage exercise are listed in Table 13 below.

Table 13: Number Of Records Transcribed And Used In Linkage Of Data, 1871-1901.

	Period	*Number Of Records Used In Linkage*	*Total Number Of Records Transcribed*
Births	2/4/1871 – 3/4/1881	15,294	
	3/4/1881-5/4/1891	17,098	
	5/4/1881- 31/3/1901	17,764	
	Total 2/4/1871 – 31/3/1901	**51,677**	**68,318**
Deaths	2/4/1871 – 3/4/1881	10,188	
	3/4/1881- - 5/4/1891	10,354	
	5/4/1881 – 31/3/1901	11,559	
	Total 2/4/1871 – 31/3/1901	**32,101**	**43,020**
Census	2/4/1871	42,711	
	3/4/1881	50,341	
	5/4/1891	56,974	
	31/3/1901	66,638	
	Total 1871, 1891, 1901	**216,664**	**166,323**

IMPACTS

With the closure of the civil registers to academic research, the post civil registration era (1837 onwards) understanding of the mortality and fertility developments of the late nineteenth and early twentieth century has been severely hampered. One major impact of the research will be to show that a major sociological and demographic study of a large urban area over a period of four decades is possible by using copies of the birth and death registers made for vaccination and other purposes. The findings on the role of local environments in shaping mortality patterns, and the cohort analysis of infant, child and adult mortality, will add to an understanding of the determinants of mortality, of interest to all professionals working in the field of preventative social health policy. Also the research will add to our understanding of the fertility and mortality transitions that took place at the end of the nineteenth and beginning of the twentieth century, opening a whole new field of scholarship, and illuminating the process of demographic transition in many developing countries which is currently being re-assessed.

The project has produced three versions of a large and complex dataset which individually or collectively may be used both as a research tool and a teaching resource for those with interests in economic and social history, demography, geography or health studies as well as scholars of Ipswich's local history.

With the data preparation and linkage now largely completed there are many research questions which may be addressed. Amongst these are some raised in the course of the data linkage exercise. For example, the finding concerning the inter-changeability of forenames would merit further attention as this has profound implications for any future linkage research and also has commercial implications for those supplying the increasing number of online genealogical sources most of which are indexed on one forename only.

CONCLUSIONS AND FUTURE RESEARCH PRIORITIES

The project has transcribed a total of 85,611 births and 53,748 deaths registered for the period 1871-1910. Additionally, census entries were transcribed for 166,323 individuals enumerated in the 1871, 1891 and 1901 censuses, along with 1,707 Anglican marriages for 1871-1881.

Of the 51,677 births recorded in 1871-1901, 76.4 per cent were linked to either a death record before the next census or to the census itself. Of the 32,101 deaths that took place in 1871-1901, 74.0% were accounted for either by a link to births or to the previous census, and it was possible to link 90.9% of deaths under the age of one to a previous birth record. Of the 150,026 individuals enumerated in the 1871, 1881 and 1891 censuses, 83,934 – 55.9% – were accounted for either through linkage to the next census or to a death record before that census.

The transcription and linkage of data on this scale is a major achievement, and an evaluation of the quality of the nominal record linkage data through a series of internal checks indicates that it was of a very high quality.

An analysis of the selected samples was used for classifying socio-economic status, as well as examining the relationship between socio-economic status and patterns of residence, mortality and fertility. A number of findings emerged from this provisional analysis: 1. The proportion of families leaving Ipswich between 1871 and 1881 was similar amongst elite and labourers' families – approximately 19 and 17 per

cent. 2. Labourers were more likely to change street address than families with domestic servants. 3. There were no significant socio-economic differences in adult mortality in the 1870s, but this was replaced by an emerging gradient in the 1890s, associated with a fall in mortality amongst elite families. 4. There were minimal differences in infant and child mortality in the 1870s, but a strong association between socio-economic status and early mortality in the 1890s, again linked to a reduction in mortality amongst families with domestic servants. 5. Fertility was slightly higher amongst the elite group than in labourer's families in the 1870s, but this pattern was reversed in the 1890s, with a slight increase in fertility amongst labourers but a significant fall in servant-keeping families.

The above findings will have to be evaluated by a detailed analysis of the full database, using a variety of measures of socio-economic status, as well as examining the role of geographical and other factors in shaping the changing pattern of demographic experience. This will include an analysis of the interaction of a number of variables, including socio-economic status, geographical residence, adult, infant, child mortality and fertility.

The late nineteenth century was a period of rapid cultural and social change, which included both an increased knowledge of disease causation and the role of hygiene in preventing mortality, as well as a growing acceptance of birth control, particularly amongst middle class families. It is possible that many of the late nineteenth demographic changes outlined in this report were primarily the result of life-style changes in middle class families, involving reductions in adult as well as infant/child mortality and fertility. The relationship and interaction of the variables involved in these processes will have to be examined in detail. Understanding these patterns of change has a relevance to the current debate among epidemiologists about the role of inequality and social class in shaping adult mortality in the twentieth and twenty-first centuries, as well as the understanding of the demographic transition in both historical and current populations. The success of the current research project will ensure that it makes a significant contribution to this major debate.

FOOTNOTES.

1 . On infant mortality see for example: R.I. Woods, P.A. Watterson & J.H. Woodward, 'The causes of rapid infant mortality decline in England and Wales, 1861-1921. Part I', *Population Studies,* 42 (1988) pp. 343-66, and 'Part II', *Population Studies,* 43 (1989) pp. 113-32; N. Williams & C. Galley 'Urban-rural differentials in infant mortality in Victorian England', *Population Studies,* 49 (1995) pp. 401-20; N. Williams & G. Mooney 'Infant mortality in "an age of great cities": London and English provincial cities compared, c. 1840-1910', *Continuity and Change,* 9 (1994) pp. 185-212; G. Mooney, 'Did London pass the sanitary test? Seasonal infant mortality in London, c. 1870-1914', *Journal of Historical Geography,* 20,2 (1994) pp.158-74. For the importance of social and spatial variation at the local level see: N. Williams 'Death in its season: class, environment and the mortality of infants in nineteenth century Sheffield', *Social History of Medicine,* 5 (1992) pp. 71-94; E.M. Garrett & A. Reid 'Thinking of England and taking care: family building strategies and infant mortality in England and Wales, 1891-1911', *International Journal of Population Geography,* 1, (1995) pp. 69-102.

2. S. Macintyre, S. MacIver, & A. Sooman, 'Area, class and health: should we be focusing on places or people?', *Journal of Social Policy,* 22:2 (1993) pp. 213-34.

3. A. Forsdahl, 'Are poor living conditions in childhood and adolescence an important risk factor for arteriosclerotic disease?', *British Journal Of Preventative And Social Medicine,* 31 (1977) pp. 91-95; C. Buck and H. Simpson, 'Infant diarrhoea and subsequent mortality from heart disease and cancer', *Journal Of Epidemiology And Community Health,* 36 (1982) pp. 27-30; D.J.P. Barker and C. Osmond, 'Infant mortality, childhood nutrition, and ischaemic heart disease in England & Wales', *The Lancet* (May 10 1986) pp. 1077-1081; D.A. Leon and G. Davey Smith, 'Infant mortality, stomach cancer, stroke, and coronary heart disease: ecological analysis', *British Medical Journal,* 320 (24 June 2000) pp. 1705-1706.

4. D. Dorling, R. Mitchell, M. Shaw, S. Orford and G. Davey Smith, 'The ghost of Christmas past: health effects of poverty in London in 1896 and 1991', *British Medical Journal,* 321 (23-30 December 2000) pp. 1547-1551.

5. This conclusion is based on births and infant deaths in the Fulham registration district for the years 1876, 1877, 1881, 1882, 1887 and 1888. We are grateful to Sue Smith for allowing us to cite findings from her post-graduate research at the Open University.

6. The registration districts covered by the project are Fulham, Ipswich, Bungay, Felixstowe, Loughborough and Hollingsbourne.

7. *Report On The Sociological Study Of Fertility And Mortality In Ipswich 1872-1881* submitted to the Economic And Social Research Council, 2000, p. 7.

8. A. Reid, R. Davies and E. Garrett, "Nineteenth century Scottish demography from linked censuses and civil registers: a 'sets of related individuals' approach", *History and Computing,* Vol. 14, forthcoming.

9. In 1871 four of the eight untraced deaths were husbands/wives of widows and widowers in 1881, and 4 were of spouses who had remarried. In 1891 eight of the untraced deaths were husbands and wives of widows and widowers in 1901, and six were of spouses who had remarried.

10. Report, 'The Sociological Study of Fertility and Mortality in Ipswich, 1872-1881' submitted to the ESRC 2001, Ref R000238429. No attempt was made in our pilot research to measure patterns of adult mortality in the 1870s.

11. B. Seebohm Rowntree, *Poverty: A Study Of Town Life,* (London, 1901) pp. 222-294.

12. For a discussion of the poverty of labourers at the end of the nineteenth century, see Rowntree, *op.ci.t,* pp. 136, 137.

13. For this table, all elite families were selected from the 1871 census and were compared to those whose heads were described as labourers. Not all types of labourers' families were selected for this aspect of the research, but only those designated simply as labourers.

14. For other evidence of the absence of a socio-economic gradient in adult mortality before the late nineteenth century, see Peter Razzell and Christine Spence, 'The hazards of wealth: adult mortality in England before the twentieth century', *Social History of Medicine*, forthcoming.

15. Full vaccination birth registration did not start until the year 1872, and some missing births for 1871 were traced in the subsequent census. Some 1871 births resulting in infant or child death may have been under-counted, but this is not likely to have been a significant number or varied greatly between the different socio-economic groups.

16. The samples considered in this report are between a quarter and a fifth of the total number of families with domestic servants and those headed by labourers enumerated in the censuses. Also, in subsequent research, an analysis will be carried out on all families, classifying occupations into social class groups.

17. Numbers at risk in the 1-4 group were truncated by being in observation for at least four years before the date of the later census.

Available online at www.sciencedirect.com
SCIENCE DIRECT®
ELSEVIER
Economics and Human Biology 4 (2006) 264–265
ECONOMICS AND HUMAN BIOLOGY
http://www.elsevier.com/locate/ehb

Book review

J. Riley, Poverty and Life Expectancy: The Jamaica Paradox, Cambridge University Press, 2005 (xiv + 235 pages, ISBN 0-521-85047-9).

James Riley is well-known for his work in the history of disease and illness, but in recent years has turned his attention to changing mortality patterns in developing countries. The present book is an extension of this research, explicitly bringing the perspectives and skills of the historian to modern problems, and focusing on the mortality history of one developing country – Jamaica – in the nineteenth and twentieth centuries.

The main aim of the book is to explore in detail a thesis developed by Riley in his earlier work on global rising life expectancy. His starting point is the work of Caldwell and others, which emphasized the possibility of achieving mortality reductions in countries with widespread poverty. Many of these countries were socialist regimes with a high priority on public investment in health and education, which in spite of a relative lack of economic development, had experienced significant increases in life expectancy.

Riley is concerned to argue that these health improvements can also be achieved in non-socialist countries. He believes that this is strategically important, and that policies for mortality reduction can be utilised more widely in all types of regime. He points out that even autocratic societies – such as those in Oman and Jordan – have been able to increase life expectancy in spite of widespread poverty and restrictions on women's autonomy and education.

He develops this theme in his study of Jamaica, showing that in spite of stagnating economic development and a colonial political structure, age-specific mortality fell by more than a half in all groups under the age of 45 years in the period between 1920–1922 and 1949–1951. This was at a time when per capita incomes were essentially unchanged and before the advent of modern medicine.

Riley examines a range of factors which might be responsible for the improvement of health. Although he notes mortality fell significantly in the nineteenth century, he focuses mainly on the period after 1920. He points out that a very effective public health administration had been introduced by the colonial regime well before 1920, but that mortality only fell in the twentieth century after that date. He concludes: 'The Jamaica way of elevating life expectancy rested on two pillars, individuals' capacity to fend for themselves and the government provision of schools, public health resources, and health care. In the early decades of the health transition, the 1920s and 1930s, individuals fending for themselves played the stronger part, but the leadership of public health authorities was important.'

Riley is undoubtedly correct in thinking that economic development has not been essential for the improvement of health and the reduction of mortality, and he argues this case cogently and persuasively. He has applied his skills as a historian very effectively to the problems of health in

1570-677X/$ – see front matter © 2006 Elsevier B.V. All rights reserved.
doi:10.1016/j.ehb.2006.03.001

the modern world, and the book is an important contribution to this wider debate deserving wide readership.

There are however certain weaknesses in the book, mainly with respect to the pre-1920 period. Riley cites evidence to show that the crude death rate in Jamaica fell from approximately 40 per 1000 in the 1830s to 27 per 1000 in 1861–1871. This suggests that there were major improvements in health before the 1920s, and this could be important for Riley's discussion of mortality decline. He makes sporadic references to smallpox vaccination, but does not discuss its systematic practice and effect on Jamaican mortality. Vaccination was made compulsory in Britain in 1853, and it is likely that the colonial regime implemented some form of compulsory vaccination in its colonies. Smallpox had become a very virulent disease by the 1880s – it was killing about 45% of unvaccinated children at this time – and its control and elimination would have been critical for the reduction of mortality in the nineteenth century.

Perhaps a more important issue is Riley's failure to discuss the consequences of mortality reduction. He notes that fertility remained high until the 1960s and that population was expanding rapidly during the nineteenth and twentieth centuries. There was a great deal of unemployment and poverty on the island, but Riley does not link rapid expansion of population with Jamaica's economic problems. Since the 1960s, fertility has fallen significantly – from about 6 children per family to 2.5 in the year 2000 – and this is likely to have major repercussions on the island's economy and social structure.

However, this should not detract from what is a major publication in demographic scholarship: the detailed analysis and account of a mortality revolution which took place in an impoverished society, which although failed to develop economically, transformed the health and the life-chances of its population.

Peter Razzell*
Department of History, Essex University,
Wivenhoe Park, Colchester, England N2 9QA, United Kingdom

*Tel.: +44 208 883 8795
E-mail address: peter.razzell@clara.co.uk

1 March 2006

Population and Disease:
Transforming English Society, 1550-1850

This book is dedicated with love
to my brothers Ted, Graham and John,
sisters Margaret and Sue,
daughter Jos,
son Luke,
and to Tinka whose sense of humour and warm support has been
invaluable in the writing of this book.

Population And Disease:
Transforming English Society, 1550-1850

Peter Razzell

Caliban Books

Published 2007
Caliban Books
Copyright Peter Razzell
ISBN 978-1-85066-047-7

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior permission of the copyright owner.

Acknowledgements

I would like to express my special thanks to Christine Spence, who co-authored three of the papers that form the basis of essays 4, 8 and 10, as well as commenting in detail on the rest of the book.

The comments on different aspects of the book by the following are also greatly appreciated: Massimo Livi Bacci, Jack Caldwell, John Cleland, Michael Drake, Roderick Floud, Eilidh Garrett, Bernard Harris, Andrew Hinde, John Landers, John Morrill, Cormac O'Grada, Samuel Preston, Ruth Richardson and the anonymous referees of the various publications in which some of these essays first appeared. The generous help of Sue Gibbon and members of staff of the Society of Genealogists' library has also been invaluable.

The financial support of the Wellcome Trust and the Economic & Social Research Council has been essential for the research on which the book is based, and is greatly appreciated.

Contents

		Page
Acknowledgements		v
Tables		ix
Illustrations		xv
Introduction		xvii
PART 1	METHODOLOGY	
1	Evaluating the same-name technique as a way of measuring parish register reliability	3
2	An evaluation of the reliability of Anglican adult burial registration	19
PART 2	THE STRUCTURE OF DEMOGRAPHIC CHANGE	
3	Review of E.A. Wrigley et al.'s *English Population History From Family Reconstitution*	43
4	Poverty or disease environment − the history of mortality in Britain, 1500-1950	89
5	Population, poverty and wealth: the history of mortality and nuptiality in England, 1550-1850	125
PART 3	CAUSAL FACTORS IN MORTALITY DECLINE	
6	The role of personal, domestic and public hygiene in shaping English mortality patterns, 1500-1899	147

7	Introduction to the new edition of *The Conquest of Smallpox*	177
8	The hazards of wealth: adult mortality in pre-twentieth century England	197
PART 4	THE CONSEQUENCES OF POPULATION CHANGE	
9	Demography, economics and the changing social structure of England during the industrial revolution	229
10	Mortality, population and poverty: a historical perspective	253
	CONCLUSION	271
	BIBLIOGRAPHY	275
	NAME AND PLACE INDEX	294
	SUBJECT INDEX	307

Tables

		Page
1.1	Estimated proportions of unregistered births, 1761-1834	5
1.2	Proportion of eligible families using same names in six reconstitution parishes, 1541-1837	9
1.3	Burial registration accuracy amongst wealth and non-wealth holders in London, using the same-name and enumeration listing/ parish register comparison methods, 1681-1709	13
1.4	Estimated infant and child (1-4) mortality rates (per 1000), London, 1681-1709	14
1.5	Analysis of burial registration of same-name siblings in nine reconstitution parishes, 1538-1837	15
2.1	The burial registration of husbands and wives in families enumerated in Lyme Regis, 1695 and 1703	21
2.2	People named in probate records and traced in thirteen Bedfordshire burial registers, 1538-1849	26
2.3	People named in probate records and traced in thirteen Bedfordshire burial registers by individual parish, 1538-1849	27
2.4	The relationship between population size in thirteen parishes and the proportion of individuals traced in Bedfordshire burial registers, 1538-1849	28
2.5	People named in probate records and traced in thirteen Bedfordshire burial registers by occupation, 1538-1849	29
2.6	People named in probate records and traced in the burial registers of seven individual parishes	30
2.7	Comparison of information on pauper burials in poor law records and parish registers	32
2.8	Components of death under-registration in England, 1630-1799	33

2.9	Non-conformist burial registers, Bedfordshire Family History Society's database, 1538-1850	34
2.10	Proportions of untraced births by population size of parish, 45 Parishes, 1761-1834	38
3.1	The Cambridge Group's estimates of unregistered births in England & Wales, versus individuals listed in the 1851 census but not found in the baptism register, 1761-1834	46
3.2	English baptism and burial rates (per 1000) calculated from Cambridge Group data	47
3.3	Mean age of first marriage of women, reconstitution sample, 1610-1837	58
3.4	Age at first marriage of women listed in marriage licenses, 1660-1714	64
3.5	Age and marital status in Lichfield, 1695 And 1851	65
3.6	Proportion of widowed mothers remarrying in East Kent	66
3.7	Infant and child mortality rates (per 1000) in nineteen Cambridge Group reconstitution parishes, 1650-1837	70
3.8	Estimated infant and child mortality rates (per 1000) in nineteen reconstitution parishes, 1650-1837.	70
3.9	Infant and child (age 1-9 Years) mortality rates (per 1000) in 6 small rural parishes compared with 20 large parishes, Cambridge Group's reconstitution sample, 1650-1837	72
3.10	Infant and child (age 0-4 Years) mortality rates (per 1000) for the parishes of Poddington and Elstow, Bedfordshire, 1700-1899	74
3.11	Estimated infant and child (0-4) mortality rates (per 1000) in Poddington and Elstow, Bedfordshire, 1700-1899	74
3.12	Estimated infant and child mortality (per 1000) in Ampthill, Norwich, Canterbury, Ipswich, and London in the late seventeenth and early eighteenth centuries	76

3.13	Paternal mortality amongst fathers of brides marrying under 21, Vicar-General's marriage licences, 1600-1849	80
3.14	Paternal mortality amongst fathers of brides marrying under 21, East Kent and Vicar-General's marriage licences, 1600-1849	81
3.15	Life expectancy (years) amongst adult Quakers, 1650-1849	82
3.16	Paternal mortality amongst fathers of brides marrying in Nottinghamshire, 1661-1793	83
3.17	Number of years lived after admission to the Merchant Adventurers' Company, Newcastle-On-Tyne, 1660-1779	85
4.1	Mortality amongst the British Royal Family (sons and daughters of Kings and Queens), 1500-1899	91
4.2	Estimated Quaker infant mortality (per 1000) in England and Ireland, 1650-99	94
4.3	Estimated infant and child mortality (per 1000) in English parishes, 1650-99	95
4.4	Estimated infant and child mortality (per 1000) in nine English rural parishes, 1650-1849	99
4.5	Mortality amongst fathers listed in the British apprenticeship register 1710-1713 by area of residence of father	101
4.6	Estimated infant and child mortality (per 1000) amongst socio-economic elite and non-elite families in St. Bartholomew's, London, and Truro, Cornwall, 1619-1750	103
4.7	Estimated infant and child mortality (per 1000) amongst wealth and non-wealth holding families in City of London parishes and Lyme Regis, Dorset	104
4.8	Estimated infant and child mortality (per 1000) by occupational status in ten parishes, 1650-1749	105
4.9	Mortality amongst fathers listed in the British apprenticeship register 1710-13 by amount of premium paid	106

4.10	Mortality amongst London fathers listed in the British apprenticeship register 1710-13 by amount of premium paid	107
4.11	Estimated infant mortality (per 1000 Births) amongst Quakers in Great Britain, 1650-1849	108
4.12	Estimated infant and child (1-4) mortality rates (per 1000) in St. Bartholomew's London, Truro, Ampthill, nineteen Cambridge Group parishes, and ten small rural parishes, 1650-1837	109
4.13	Socio-economic status and estimated infant/ child mortality (per 1000) in Truro, 1629-1837	111
4.14	Occupational status and estimated infant/ child mortality (per 1000) in eleven parishes, 1812-37	112
4.15	Social class and infant and child (1-4) mortality rates (per 1000) in Ipswich 1872-1880	113
4.16	Infant mortality rates (per 1000) by occupational group in the district of Ipswich, Suffolk, 1875-1911	114
4.17	Social class and infant mortality (per 1000) in Warwick, 1876-1918	114
4.18	Paternal mortality amongst fathers of spinsters marrying under 21, by occupation of husband in East Kent, 1619-1809	116
4.19	Paternal mortality amongst fathers of brides and grooms marrying under 21 in Nottinghamshire and Sussex, 1754-1800	117
4.20	Expectation of life (years) for males aged 25, 1600-1824	117
5.1	Proportion of brides and grooms born in parish of marriage in West Sussex, by groom's occupation, 1775-1800	127
5.2	Mean age of marriage (years) of spinsters, by occupation of groom, Nottinghamshire, 1670-1769	128
5.3	Proportions of women ever married in individual parishes , 1585-1851	130

5.4	Estimated infant and child mortality (1-4) rates (per 1000) amongst elite and control families in 115 Bedfordshire parishes, 1600-1849	133
5.5	Estimated infant and child (1-4) mortality (per 1000) in the City of London, 1539-1849	134
5.6	Infant, child and adult mortality in London by rateable value of district, 1838-44	136
5.7	Estimated infant and child (1-4) mortality (per 1000) of merchants & professionals and the total population of Liverpool, 1675-1749	138
7.1	Smallpox deaths amongst children and adults in English parishes	179
7.2	Age incidence of smallpox cases and deaths in Aynho, Northamptonshire, 1723-24	185
7.3	Age specific case fatality rates of smallpox in unvaccinated persons in Madras, 1961-69	186
7.4	Age specific case fatality rates of smallpox in the Whitehaven dispensary, 1783-1804	186
7.5	Smallpox mortality in Hindley, Lancashire, 1779-1814	189
7.6	Smallpox mortality in Ackworth, Yorkshire, 1745-1812	190
8.1	Expectation of life (years) at aged 20 amongst the aristocracy and the population of England & Wales	198
8.2	Mean adult male duration of life amongst the peerage and in England, mid-nineteenth century	199
8.3	Median age of marriage (years) of grooms listed in Nottinghamshire marriage licences, 1701-1753	200
8.4	Mortality amongst husbands and wives enumerated in Bedfordshire censuses, 1841-1851	202
8.5	Social class and adult mortality (per 1000) among husbands and wives, Ipswich, 1871-1881 and 1891-1901	204
8.6	Index of real income and the per capita consumption of tobacco in the United Kingdom, 1850-1936	218

8.7	Expectation of life (years) amongst Friendly Society members	222
8.8	Mortality among persons of intemperate habits compared to that of the general population in England and Wales	223
9.1	Mean height of men aged 23-50, 1700-1799	232
9.2	Social origins of Indian army officers, 1758-1834	236
9.3	Social origins and the occupations of fathers of bishops and archbishops in Great Britain, 1530-1849	237
9.4	Social origins of elite occupations in Great Britain, 1550-1849	239
9.5	Median age at first marriage of women marrying in Gloucestershire, 1637-1680	242
9.6	Mean age of marriage (years) of spinsters by occupation of groom, Nottinghamshire, 1670-1769	243
9.7	Proportion of spinsters marrying under twenty-one in the Archdeaconaries of Chichester and Lewes, Sussex, 1754-1839.	244
9.8	Mean age at marriage of women enumerated in the 1911 fertility census, England and Wales	244
10.1	GDP per capita annual growth rates and the reduction of under five mortality in third world countries, 1970-2002	257
10.2	Mortality, negative economic growth, health expenditure and immunization	260
10.3	Mortality, fertility, population growth, GDP growth and poverty	266

Illustrations

Page

Figure 1: The Prince of Wales*: 'A voluptary under the horrors of digestion*.' (Gillray) 196

Figure 2: '*Death in the bowl*.' (Rowlandson) 217

Figure 3: '*Drunk and alive, the man was thine, but dead and drunk, why he is mine.*' (Rowlandson) 217

[We would like to thank the Ashmolean Library for permission to use Figure 1, and the Wellcome Trust Library for allowing us to reproduce Figures 2 and 3.]

Introduction

The ten essays in this book, six of which have been published previously, have been written during the last decade. Although there is a significant degree of overlap, they have been arranged under four subject headings: methodology, structure of demographic change, causal factors in mortality decline, and the consequences of population change. Within these subject headings, the essays have been presented in the order they were written, and have been edited and re-written to minimize duplication of content. Extra data has been added to individual essays, where appropriate, and a general line of argument has been developed, moving from detailed methodological and empirical analysis to an overall discussion of England's demographic, economic and social history.

The essay format is particularly suitable for the philosophy of the book: scepticism about mathematical models in historical research, and a belief that theoretical thinking is most fruitfully developed through detailed empirical research based on local sources. The most appropriate analogy is the jig-saw puzzle: the construction of a general picture through the careful assembly of individual items, some clearly defined and others either ambiguous or uncertain.

The most important method used in the research is that borrowed from navigation and surveying, the technique of 'triangulation'. I believe this is particularly relevant to the social sciences, where measurement is often difficult and imprecise. The methodology used has involved, not only the measurement of variables from different numerical sources, but also literary evidence from published and unpublished material.

The book reflects a demographic tradition which argues that population change is exogenous to economic development, resulting in a range of economic and social consequences. Habakkuk, Chambers and others, exploring the role of population, were unable to successfully establish that population change was independent of economic development because of the lack of reliable data.[1] One of the aims of the book is to present detailed

[1] See H.J. Habakkuk, 'The economic history of modern Britain', D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography*

evidence confirming the exogenous role of population growth, mainly shaped by changes in mortality.

Adult mortality reduced by about a half during the eighteenth century ─ most of which occurred in the first half of the century ─ and infant and child mortality fell sharply at the end of the eighteenth and beginning of the nineteenth century. The reduction in adult mortality appears to have been independent of economic and medical developments, whereas the fall in infant and child mortality was probably due to a range of medical and other improvements.

The essays challenge a number of leading ideas in demography, epidemiology, economic history and historical sociology. The topics discussed include life table models, demographic transition theory, cohort patterns of mortality, and the relationship between height, status stress, poverty and mortality. One major theme is the link between economic and demographic change. Smith, Malthus, Marx, Marshall and others all assumed that economic factors are the main determinants of demographic, sociological and political development. By contrast, the evidence presented in this book suggests that demographic factors were the prime movers of English history, and that demography is a key discipline for the understanding of the transformation of English society in the seventeenth, eighteenth and nineteenth centuries.

(London 1965); J. D. Chambers, *Population, Economy and Society in Pre-Industrial England* (Oxford 1972).

I

Methodology

1. EVALUATING THE SAME-NAME TECHNIQUE AS A WAY OF MEASURING PARISH REGISTER RELIABILITY.[2]

Anglican parish registers have formed the basis of most demographic research for the period before 1837, but have suffered from "that constant and basic problem, the quality of the parish register being studied."[3] In an important study of the subject, J.T. Krause concluded that "parochial registration was relatively accurate in the early eighteenth century, became somewhat less so in the 1780s, virtually collapsed between roughly 1795 and 1820, and then improved somewhat between 1821 and 1837."[4] This conclusion was based on a general study of registration accuracy, with a particular emphasis on the impact of religious dissent on the effectiveness of Anglican registration.[5] Krause made no attempt to directly measure the reliability of parish registers, and concluded that when estimating the reliability of parochial registration "the impressionistic method of the historian, rather than the quantitative method of the statistician must be relied upon."[6]

Krause's work influenced the research of a number of other scholars, including Wrigley and Schofield who assumed that the success of the Anglican Church in countering religious non-conformity was a measure of its effectiveness in ensuring the registration of vital events.[7] It was partly on the basis of this assumption that Wrigley and Schofield concluded that Anglican parish registers were almost perfect at the beginning of registration in the 1540s, but deteriorated significantly at the end of the eighteenth century, mirroring Krause's general conclusions on the subject.[8] In addition to figures on the number of non-conformist

---

2 First published in *Local Population Studies*, Number 64 (2000), pp. 8-22.

3 R.E. Jones, 'Further evidence on the decline in infant mortality in pre-industrial England: north Shropshire, 1561-1810', *Population Studies*, Vol. 34 (1980), p. 250.

4 J.T. Krause, 'The changing adequacy of English registration , 1690-1837', D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography* (London 1965), p. 393.

5 Krause, 'The changing adequacy', pp. 379-393.

6 *Ibid*, p. 380.

7 E.A. Wrigley and R.S. Schofield, *The Population History of England, 1541-1871: a Reconstruction* (London 1981), p. 137.

8 *Ibid*, p. 561.

baptisms and burials, Wrigley and Schofield used estimates of the effects of delayed baptism and other factors involved in "residual" inflation ratios, but because of uncertain data in these calculations, they accepted the "arbitrary" nature of the "final inflation ratio".[9]

Wrigley and Schofield's assumption that Anglican registration accuracy reflected the amount of religious non-conformity is open to question. There is some evidence to suggest that under-registration was not primarily due to the rise of religious non-conformity but was mainly the result of the negligence of clergymen and parish clerks in registering vital events which took place in their parish, as well as their refusal to register events on account of non-payment of fees.[10]

Although Wrigley and Schofield did not directly measure the adequacy of parish registration, they did attempt to assess it for the period 1801-1841 by estimating the total number of births and deaths in England and Wales.[11] They achieved this by applying a standard life table to data from national censuses, and although there is a degree of uncertainty in their use of a particular life table and the assumption of zero net migration, the procedure did enable them to derive an empirical measure of registration reliability. As they were reliant on national census returns for their estimation of birth and death under-registration, Wrigley and Schofield could not apply the same measures to the period before 1801.

I have carried out nominal-linkage research on a country wide sample of 45 parishes, comparing information about age and birthplace for individuals in the 1851 Census with data from Anglican baptism registers.[12] Table 1.1 compares Wrigley and Schofield's estimates of the proportions of births missing from

---

9 Wrigley and Schofield, *The Population History*, p. 137.

10 Much negligence resulted from the practice of entering events in rough note books and only copying them up at very irregular intervals, a practice that was present from the very beginning of parish registration. This is evidenced by the significant discrepancies in the number of entries in surviving rough note books and parish registers. For a detailed discussion of this topic see D.J. Steel, *General Sources of Births, Marriages and Deaths before 1837* (National Index of Parish Registers, Volume 1, 1968), pp. 27-31. For further discussion, P.E. Razzell, *Essays in English Population History* (London 1994), pp. 108-111. For evidence on the role of non-payment of fees see pp. 31, 36 of the present volume.

11 Wrigley and Schofield, *The Population History*, pp. 126-135.

12 Razzell, *Essays in English Population History*, pp. 82-149.

Anglican registers, with the proportions of births not found in the sample of 45 baptism registers.

Table 1.1: Estimated Proportions Of Unregistered Births, 1761-1834.[13]

Period	*Wrigley and Schofield's Estimates Of Unregistered Births, England And Wales %*	*Comparison Of 1851 Census With Baptism Registers (Razzell) %*
1761-1770	- -	32.4
1771-1780	- -	27.9
1781-1790	- -	32.6
1791-1800	- -	36.0
1801-1810	27.6	32.0
1811-1820	32.3	33.0
1821-1830	29.9	30.0
1831-1834	26.2	27.4

The figures for 1801-1834 are very similar, providing some support for the validity of both forms of data. Table 1.1 also suggests that the sample of 45 parishes is approximately representative of national totals during the first four decades of the nineteenth century.

Although the Cambridge Group's findings and my own on the pattern of parish registration in the period 1801-1841 are approximately similar, there is a major discrepancy in conclusions about birth registration in the period before 1801. Wrigley and Schofield have estimated that 13.5 per cent of all births were omitted from baptism registers in 1761-1770, a proportion that increased to 14.6 per cent in 1771-1780, 17.9 per cent in 1781-1790 and 23.2 per cent in 1791-1800.[14] Considered with their data presented in Table 1.1, this indicates a gradual deterioration of birth registration in this period, followed by a sharp decline after 1811.

---

13 For the sources on which this table is based, see Wrigley and Schofield, *The Population History*, pp. 543, 544; Razzell, *Essays in English Population History*, p. 95.

14 See Table 3.1, p. 46.

However, my findings show that between a quarter and a third of all births had been omitted from the parish registers, with little or no trend in reliability between 1761 and 1834.

The Same-Name Technique As A Way Of Measuring The Accuracy Of Burial Registration.

Wrigley, Davies, Oeppen and Schofield have discussed ways of assessing parish register accuracy through statistical analysis and general demographic modelling of data.[15] There are, however, a number of difficulties with this mode of analysis. Wrigley and his colleagues acknowledge that this approach to measuring registration reliability is somewhat unsatisfactory: "In most periods the lack of a reliable alternative data source makes it impossible either to test effectively the completeness of Anglican registration by direct comparison with independent evidence, or to establish whether the demography of the Anglican community was similar to that of the population as a whole. For the bulk of the parish register period, therefore, the testing of registration must depend on the internal plausibility and internal consistency of the results obtained."[16]

The census/ parish register method only allows an assessment of birth registration from about 1761 onwards, and has nothing to say about burial under-registration. Fortunately, in addition to this method, there is one source of data which allows the direct study of burial and baptism registration reliability.

It was the custom in England and elsewhere sometimes to give the name of a dead child to a subsequent sibling of the same sex. This custom can form the basis of a method for measuring burial registration reliability. Louis Henry in France and Roger Finlay in England explored the use of information on same-names for this purpose, but concluded that this method was subject to a degree of uncertainty on account of some living siblings sharing the same names.[17] There is, however, evidence that same-names were

---

15 E.A. Wrigley, R.S. Davies, J.E. Oeppen and R.S. Schofield, *English Population History from Family Reconstitution, 1580-1837* (Cambridge 1997), pp. 101-106.

16 *Ibid*, pp. 91-92.

17 L. Henry, *Manuel de Demographie Historique* (Paris 1967), pp. 22-23; R. Finlay, *Population and Metropolis* (Cambridge 1981), pp. 45-49.

not given to living siblings in England after the middle of the seventeenth century, and the practice may never have existed even at an earlier period.[18] This issue will form a central part of this essay, but it is first necessary to explain the nature of the method and how it can be used to measure burial registration reliability.

The custom of giving same names can be illustrated by baptisms and burials in the family of Thomas and Ann Duckett in the marsh parish of Canewdon, Essex, which listed in date sequence, were as follows[19]:

1. Thomas son of Thomas and Ann Duckett, baptised 21/6/1724, buried 4/8/1724.
2. Ann daughter of Thomas and Ann Duckett, baptised 13/4/1726.
3. Mary daughter of Thomas and Ann Duckett, baptised 2/8/1727, buried 11/10/1727.
4. Mary daughter of Thomas and Ann Duckett, baptised 14/2/1729, buried 19/2/1729.
5. Mary daughter of Thomas and Ann Duckett, baptised 4/3/1730, buried 20/4/1730.
6. Thomas son of Thomas and Ann Duckett, baptised 31/5/1731, buried 26/6/1731.
7. Mary daughter of Thomas and Ann Duckett, baptised 20/10/1732, buried 29/11/1732.
8. John son of Thomas and Ann Duckett, baptised 24/1/1734, buried 16/3/1734.
9. Thomas son of Thomas and Ann Duckett, baptised 12/3/1735, buried 9/5/1735.

The name Mary was given to four of Thomas and Ann Duckett's children, three of whom had died prior to the baptism of their same-name sisters. Likewise, there were three sons who were given the name of Thomas, two of whom had died before the baptism of their same-name brothers. In this family, burial registration was perfect, with the inclusion of all burials of the first of same-name pairs in the parish register. This practice of same-naming therefore allows an objective measurement of the adequacy of burial registers, by

---

[18] See the *Genealogists' Magazine*, June 1998, p.59; September 1998, pp. 95-97; and December 1998, p. 145.

[19] This information is taken from the Canewdon parish register lodged in the Society of Genealogists' library.

expressing the number of first same-name children included in the burial register as a proportion of all first same-name children. With the Duckett family, this ratio is five divided by five = 100%.

Other examples of same-name research indicate however that a parish register frequently omitted a significant proportion of baptisms or burials. For example, Thomas Turner, who lived in East Hoathley, Sussex in the middle of the eighteenth century kept a diary and he listed the births and deaths of his children as follows:[20]

1. Peter: born 19 August, 1754 and died 16 January 1755.
2. Margaret: born 20 March, 1766.
3. Peter: born 1 June, 1768.
4. Philip: born 9 November, 1769.
5. Frederick: born 8th December, 1771, died 7 November 1774.
6. Michael: born 29 April, 1773.
7. Frederick: born 3 May, 1775 and died 13 June 1775.
8. Frederick: born 17 December 1776.

The gap in the birthdates of Turner's first two children is explained by the death of his first wife, and his subsequent remarriage. The pattern of same-naming is illustrated through the repetition of the names of the first Peter and the first two Fredericks, the name of the dead child being given to the next sibling of the same sex. Turner lived all of his married life in the parish of East Hoathley, and the baptism and burials of his children in the parish register were as follows:

Peter baptised 31 August 1754
Margaret baptised 23 April 1766
Peter baptised 28 June 1768
Philip baptised 15 November 1769
Frederick baptised 30 December 1771
Michael baptised 19 May 1773
Frederick baptised 14 May 1775, and buried 13 June 1775.
Frederick baptised 10 January 1777.

Only one of the three Turner children who died was registered in the burial register, and this was because the others had been buried

[20] For details of the sources of information on the Turner family, see Razzell, *Essays in English Population History*, pp. 186, 187.

in the neighbouring parish of Framfield, where their grandparents had lived and been buried. Under family reconstitution rules, the infant and child mortality rate would be 125 per 1000 (1 out of 8 children), whereas the true rate was 375 per 1000 (3 out of 8). Yet the repetition of same-names in the baptism register would alert us to the deficiencies of burial registration, and we can derive correction ratios by expressing total second same-name cases (three) as a ratio of registered same-name burials (one).

The evidence that exists suggests that there were no significant changes in the proportion of families using same-name practices. I have conducted an analysis of the proportion of eligible families who gave same-names to their children for six of the Cambridge Group's reconstitution parishes.

Table 1.2: Proportion Of Eligible Families Using Same Names In Six Reconstitution Parishes, 1541-1837.[21]

Period	*Number Of Eligible Cases*	*Proportion Using Same Names %*
1541-1600	293	50.1
1601-1650	330	57.9
1651-1700	291	72.9
1701-1750	339	67.8
1751-1800	411	65.6
1801-1837	279	59.5

There is some increase in the early period and decline in the later one, but for most of the parish register period between a half and two-thirds of all eligible families appear to have given their children the same name as a deceased child

Evaluation Of The Same-Name Technique.

There are two potential problems with the same-name method: 1. The possibility that some same-name children were alive at the

[21] Eligible families are those with at least two baptised children of the same sex. The table is based on the analysis of original reconstitution schedules for Aldenham, Bridford, Austrey, Dawlish, Hartland and Colyton, kindly provided by the Cambridge Group.

same point of time. 2. That same-name cases are only a sample of all burials, and therefore not necessarily representative of the total population.

There is fragmentary evidence that some same-name children were both alive simultaneously, but this is based on ambiguous information in wills and other sources for the period before the middle of the seventeenth century.[22] For the late seventeenth century it is possible to examine more systematically the question of living same-name siblings through the study of various enumerations, mainly taken under the 1695 Marriage Duty Act. An examination of seventeen census-type listings for the City of London (1695), Goodnestone, Kent (1676), Clayworth, Nottinghamshire (1676 and 1688), Lichfield, Staffordshire (1697), Lyme Regis, Dorsetshire (1696, 1698 and 1703), Swindon, Wiltshire (1697 and 1702), Wanborough, Wiltshire (1697 and 1702), New Romney, Kent (1696 and 1699), Melbourne, Derbyshire (1695), and St. Mary's, Southampton, Hampshire (1695 and 1696) reveals no cases of living full same-name siblings.[23]

The same is true of the 45 parishes covered by the census/ baptism register research summarised earlier. The names of 10,954 people living in these parishes were selected from the household schedules of the 1851 Census, and found to include no living full same-name cases.[24] In most of these censuses there are references to step brothers and sisters sharing the same forename, but these can be recognised by their different surnames or other information in the censuses. Also, in the nineteenth century there are cases of living siblings sharing one common forename (for example, Edward James and Edward George), but no cases have come to light where names are identical. It is therefore important for same-name research that only siblings sharing the same parents and with identical names are selected for study.

---

22 See the *Genealogists' Magazine*, June 1998, p.59; September 1998, pp. 95-97; and December 1998, p. 145.

23 For the London listing see D.V. Glass (ed.), *London Inhabitants within the Walls* (London 1965). Copies of the other listings are lodged in the Cambridge Group's library, and photocopies of these were kindly sent to me by their archivist.

24 For details of this sample, see Razzell, *Essays in English Population History*, pp. 93-94.

The problem of the representativeness of the same-name sample is more difficult to assess. The technique requires at least two or more baptisms per family, leading to the exclusion of families with only one child. This is not likely to be a major problem, but the method also cannot be applied to unregistered baptisms or to births not resulting in baptism. This probably leads to an under-statement of the number of unregistered burials, as there was probably some correlation between unregistered births and unregistered deaths in individual families. Although insufficient research has been carried out to allow firm conclusions to be drawn, first same-name children probably represented about ten per cent of all baptisms, and a quarter of all child burials.[25]

It is possible to check the accuracy of the same-name method by cross-matching reconstitution and census data where the latter is available. I have conducted pilot reconstitution research on sixteen parishes in the City of London, linked to the published and indexed London 1695 Marriage Duty Act enumeration list.[26] The cross-matching of enumeration with reconstitution data was facilitated by the genealogical work of Percival Boyd, who compiled 238 volumes of family histories for London inhabitants, covering a total of 59,389 family groups, mainly for the seventeenth and early eighteenth centuries.[27] Boyd used parish registers, guild records, wills and a whole miscellany of sources, to create a "total reconstitution sample", a remarkable demographic and genealogical database.

The starting point of the cross-matching procedure is to assess the accuracy of the 1695 enumeration listing. Jones and Judges in their study of the Marriage Duty listing for the City of London compared the information in the list with that contained in the 1666 hearth tax, the 1673 eighteen months' tax and the 1678

---

25 For example, 8 per cent of all baptisms and 26 per cent of child burials included in a reconstitution study of two rural Bedfordshire parishes in the period 1700-1849 were first same-name children, whereas the equivalent proportions in London during the period 1681-1709 were 12 and 23 per cent. For details of the Bedfordshire study see Table 3.10, p. 74; the London research is discussed later in this essay.

26 See Glass, *London Inhabitants.*

27 This material is deposited in the library of the Society of Genealogists. For details of this source, see A. Camp, 'Boyd's London burials and citizens of London', *Family Tree*, Vol. 1 (1985), p. 12.

poll tax, and concluded that "the 1695 assessment was, almost throughout the City, conducted with more diligence and with fuller results than was usual for the period."[28] This conclusion is confirmed by Gregory King's post-enumeration survey carried out in 1696 of two London parishes, St. Benet's and St. Peter, Paul's Wharf. He found that about five per cent of cases were missing in St. Benet's and approximately nine percent in St. Peter, Paul's Wharf.[29] Glass concluded from his work on King's figures that ten per cent for the whole of London was not an unreasonable estimate of the degree of under-enumeration in the Marriage Duty listing.[30] The London returns include the names of most children and their relationship to the head of household, facilitating the linkage between the returns and associated parish registers.

The next stage in the research is to search in the enumeration listing for the children not listed in the burial register but baptised less than ten years before the date of the enumeration. The method assumes that children under ten not found in the enumeration listing or burial register (but with families still living and enumerated in the parish), had died and not been registered in the burial register. This is subject to the qualification of the under-enumeration of living children − perhaps of the order of ten per cent. This cross-matching exercise yields an estimate of the proportion of children not registered in the burial register, and this can be compared to the ratios derived from same-name research. For the London pilot sample data, we can contrast the burial registration experiences of families owning and not owning taxable wealth.[31]

---

[28] P.E. Jones and A.V. Judges, 'London population in the late seventeenth century', *Economic History Review*, Vol. 6 (1935), p. 48.

[29] Glass, *London Inhabitants,* p.xxviii.

[30] *Ibid*.

[31] Under the 1695 Marriage Duty Act, the main form of wealth liable to extra taxation was the ownership of real estate worth £600 or more, although other categories of wealth-owners were also included.

Table 1.3: Burial Registration Accuracy Amongst Wealth And Non-Wealth Holders In London, Using The Same-Name And Enumeration Listing/ Parish Register Comparison Methods, 1681-1709.[32]

	Children Baptised With Same Names Searched For In The Burial Register		*Unburied Children Searched For In The Enumeration Listing*	
	Families With Taxable Wealth	Families Without Taxable Wealth	Families With Taxable Wealth	Families Without Taxable Wealth
Number Found	46	51	97	108
Number Not Found	18	30	46	66
Proportion Found	72%	63%	68%	62%

The percentage found in both wealth groups was less in the enumeration listing/ parish register comparison than with the same-name method, and this is what we would expect from the existence of some living children not being included in the enumeration list. However, overall the levels of under-registered children are similar under both methods, with 37 to 38 per cent missing amongst non-wealth holders, and 28 to 32 per cent not found amongst the wealthy group.[33] The similarity of the findings of the two methods gives a degree of credence to both.

---

[32] The data is based on the analysis of volumes 1, 11, 21, 31, 41, 51 and 61 of Boyd's registers lodged in the library of the Society of Genealogists. Sixteen parishes were included in the analysis: St. Christopher-le-Stocks; St Edmund Lombard Street; St. Michael Cornhill; St. Mary Woolnoth; All Hallow Bread Street; St. Mary Aldermanbury; St. Martin Outwick; St. Helen Bishopgate; St. Michael Pat. Royal; St. John Walbrook; St. James Duke Place; St. Antholin; St. Mary Woolchurch; St. Dionis Backchurch; St. Michael le Quern, Allhallows the Less. Information on families with listed taxable wealth and unburied children was obtained by comparing Boyd's data with that in the 1695 Marriage Duty enumeration list. See Glass, *London Inhabitants.*

[33] Theoretically these figures can be compared to those derived by Glass and Boulton from their study of parish register and collectors' returns of births and

Of thirty-seven eligible same-name children not found in the burial register, none could be found in the enumeration listing, confirming the validity of the assumption that a missing same-name case is equivalent to an unregistered burial. Also, there were no living same-name cases among the total of 1,253 children included in the sample, giving further support to the conclusion that at the end of the seventeenth century the practice of giving the same names to living children did not exist. Finlay found 258 same-name cases in his study of four London parishes during the period 1580-1650, of which only 149 (58 per cent) could be found in the burial register.[34] He assumed some cases were untraceable in the burial register as a result of being living same-name siblings, but the evidence discussed above suggests the probability that all missing same-name cases were the result of burial under-registration.

A further check on the validity of the same-name ratios is to apply them to the uncorrected infant and child mortality rates found from the cross-matching of Boyd's reconstitution schedules with the information in the 1695 enumeration listing:

Table 1.4: Estimated Infant And Child (1-4) Mortality Rates (Per 1000), London, 1681-1709.

Infants			
Number Of Baptisms	*Infant Burials*	*Same-Name Inflation Ratio*	*Estimated Infant Mortality Rate (Per 1000)*
1253	280	145/97	334
Children Aged 1-4			
Number Of Children (1-4) At Risk	*Child Burials*	*Same-Name Inflation Ratio*	*Estimated Child Mortality Rate (Per 1000)*
733	121	145/97	247

deaths made in London for the 1695 Marriage Duty Act. Unfortunately the collectors' figures were derived from the returns made by Anglican clergymen and were not therefore independent of parish register figures. There is evidence that clergymen were negligent in recording all births and burials, which was one of the reasons why the Marriage Act legislation was repealed in 1706. See Glass, *London Inhabitants* and J. Boulton, 'The Marriage Duty Act in London', K. Schurer and T. Arkell (eds.), *Surveying the People* (Oxford 1992).

34 Finlay, *Population and Metropolis*, p. 85.

John Landers has independently estimated that infant mortality in London at the end of the seventeenth century was at least 360 per 1000,[35] and the overall estimated infant mortality for the total sample in Table 1.4 is 334 per 1000. Given that mortality before baptism is excluded from the latter figure, it is very similar to that estimated by Landers.[36] The provisional conclusion from examining all the data is that the same-name method is reasonably accurate in measuring burial under-registration.

I have analysed the proportion of same-name cases unregistered in the burial register for nine of the Cambridge Group's reconstitution parishes, using reconstitution schedules provided by the Group and relying entirely on their identification of same-names.[37]

Table 1.5: Analysis Of Burial Registration Of Same-Name Siblings In Nine Reconstitution Parishes, 1538-1837.[38]

Period	*Total Same-Name Cases*	*Number Of Burials Not Found*	*Burials Not Found %*
1538-1599	358	122	34.1
1600-1649	465	144	31.0
1650-1699	617	167	27.1
1700-1749	858	191	22.3
1750-1799	594	160	27.0
1800-1837	451	104	23.1

35 Personal communication from John Landers. According to the London Bills of Mortality, child burials under the age of two represented about 60 per cent of baptisms in the period 1728-1739, suggesting that the same-name ratios in Table 1.4 do not over-state the levels of under-registration of burials. See J. Marshall, *Mortality of the Metropolis* (London 1832), p. 63.

36 Boyd's data probably includes more wealth-holders than was typical for London as a whole. Glass estimated that about 27 per cent of the population were wealth-holders paying the higher level of taxation, lower than the proportion of wealth-holders in Table 1.3. See Glass, *London Inhabitants.*, p. xxi.

37 It is not clear whether the Cambridge Group always used the names of both parents to identify same-name siblings, but in general terms this seems to have been the case. This is important in the light of the above discussion about step-siblings and the confusion that sometimes arises on this account.

38 The nine parishes are Colyton, Hartland, Aldenham, Dawlish, Ansty, Bridford, Eccleshall, March and Shepshed. The original data was kindly provided by the Cambridge Group.

Some of the burials not located in the burial register were the result of defective information on the identity of children, who although registered, could not be linked to the reconstitution schedules.[39] Table 1.5, therefore, represents proportions of children not found in the burial reconstitution schedules, rather than general under-registration of buried children. Nevertheless, the table gives some indication of the overall trend of burial registration. It improved slightly throughout the seventeenth and early eighteenth century − the omission rate declining from 34% to 25% − and was followed by a period of more-or-less stability for the rest of the eighteenth and early nineteenth centuries.

Conclusion

The evidence reviewed suggests that the same-name method is a reliable way of measuring burial registration accuracy, and can be applied to parish registers from the sixteenth century onwards. More research will be needed on the earlier period, to assess whether any living siblings shared the same name. However, the evidence from local censuses from the late seventeenth century onwards indicates that same names were only given to children where a sibling of the same sex had died previously. The same-name method is suitable for the evaluation of most burial registers, but requires a study of infant and child mortality in individual families, and therefore cannot be used for an assessment of the adequacy of the registration of adult burials.

In order to check the validity of same-name inflation ratios, research will be required on a number of available sources, using the method of "triangulation". The analysis of late seventeenth century data for the City of London illustrates the method. Same-name research yields correction ratios very similar to those derived from the comparison of enumeration lists with parish registers, and these ratios yield rates of mortality comparable to those derived from the London Bills of Mortality and other sources.

Taken together with earlier findings on the adequacy of baptism registers, the evidence reviewed indicates that both Krause

[39] Some of the registers used by the Cambridge Group, for example, did not always include information on the names of the parents of buried children, making the allocation of children to the correct family problematic.

and Wrigley & Schofield were wrong in thinking that parish registration collapsed between 1795 and 1820. Application of the same-name method to reconstitution data suggests that burial registration of children improved gradually throughout the sixteenth and seventeenth centuries, before stabilising subsequently. Between a fifth and a third of all deaths went unregistered in the eighteenth and early nineteenth centuries, similar to levels of birth under-registration discussed previously, suggesting that there were no major changes in parish register reliability during the long eighteenth century.

Appendix.

In order to help standardise same-name research, I have drawn up some simple rules derived from my own reconstitution work on infant and child mortality. The research requires the reconstitution of families from birth/baptism through to the burial of family members. The family is assumed to come into observation at the birth/baptism of their first listed child, and leave observation at the date of the last recorded event (either birth/ baptism or burial) of a family member.

1. For a child to be included in the list of birth/ baptisms:

a. the birth/baptism entry should include the names of both parents.

b. there should be independent evidence of the family's continued residence in the parish for at least one year after the date of birth/baptism (e.g. the baptism of a younger sibling or the burial of a parent or sibling).

2. Children should be excluded when:

a. children are born/baptised on the same day (unless specified as twins).

b. children are known to be more than one year old at the date of baptism.

3. For a burial of a child to be included in the analysis:

a. the names of the child and at least one parent should be the same as that listed in the baptism register.

or b. the name of the child is the same as that in the baptism register and there is an indication in the burial register that the child is an infant or a child.

4. For a child to be counted as a same-name case:

the second child should have exactly the same Christian names(s) as the first and be born to the same parents.

2. AN EVALUATION OF THE RELIABILITY OF ANGLICAN ADULT BURIAL REGISTRATION.[40]

Introduction

The findings derived from assessments of registration reliability can have a major effect on conclusions about the population history of England and Wales in the parish register period. For example, Wrigley and Schofield concluded that the increase in population in the eighteenth century was mainly due to a rise in fertility, whereas the present author has argued that the prime determinant of population growth in this period was a reduction in mortality. Wrigley and Schofield's conclusion about the central role of fertility in their aggregative work was largely based on the inflation of baptisms at the end of the eighteenth century, derived from an assumption that birth registration deteriorated sharply during this period as a result of increasing religious non-conformity.[41]

I have presented an alternative set of figures on births based on inflation ratios calculated from census/parish register comparisons.[42] Additionally, I have compiled a range of figures on infant and child mortality for different parishes, using inflation ratios derived from same-name research.[43] Little or no work has been carried out on the accuracy of adult burial registration using nominal record linkage, and the purpose of this essay is to present some provisional findings on this topic, based on the linkage of data from enumeration listings, parish registers and probate records.

Comparing Enumeration Listings And Parish Registers.

Enumeration listings have survived for a number of parishes in the pre-1841 period, and they exist in some instances for successive

---

40 First published in *Local Population Studies*, No. 77 (2006).

41 See p. 47.

42 See Table 1.1, p. 5.

43 See Essays 3, 4 and 5.

periods of a decade or less. Where these schedules include data on the marital status of adults, it is possible to compare information on the death of an individual − for example, a husband no longer enumerated in a later listing and his wife becoming a widow − with the returns of burials in the parish register. Enumeration listings were carried out under the 1695 Marriage Duty Act, compiled in order to implement taxation on marriages, births and burials, as well as on bachelors over the age of twenty-five and childless widows. The function of these listings was to help establish the population liable for taxation. The Act ran for an eleven-year period between 1695 and 1706, and required the enumeration listings to be carried out annually.[44] The schedules for two parishes − Lyme Regis, Dorset and Swindon, Wiltshire − have survived with information on marital status for a number of years from 1695 onwards.

For Lyme Regis, 83 married couples were traced in the 1695, 1698 and 1703 listings, in which either the husband or wife disappeared between 1695 and 1703.[45] These 83 couples were in the following categories: (i) 47 husbands whose wives were later enumerated as widows; (ii) 9 wives with husbands later listed as widowers; (iii) 4 husbands whose wives were later enumerated without their husbands; (iv) 23 wives whose husbands were later enumerated without those wives, some of whom were listed with new wives. Identification of individuals was possible because of the near-identical sequence of listing of families in successive enumerations, as well as the presence of children in families.

An attempt was made to locate these 83 individuals in the Lyme Regis burial register, with the following results:

---

44 For a discussion of the Marriage Duty Act, see T. Arkell, 'An examination of the poll taxes of the later seventeenth century, the Marriage Duty Act and Gregory King', K. Schurer and T. Arkell (eds.), *Surveying the People* (Oxford 1992); J. Boulton, 'The Marriage Duty Act and parochial registration in London, 1695-1706', Schurer and Arkell, *Surveying the People.*

45 Copies of the Lyme Regis enumeration schedules were kindly supplied by the Cambridge Group's library.

Table 2.1: The Burial Registration Of Husbands And Wives In Families Enumerated In Lyme Regis, 1695 And 1703.[46]

	Total Number Of Cases	*Burials Traced*	*Proportion Of Cases Traced In the Burial Register %*
Husbands No Longer Enumerated, Wives Becoming Widows	47	24	51
Wives No Longer Enumerated, Husbands Becoming Widowers	9	9	100
Husbands No Longer Listed, Wives Enumerated In Their Own Names	4	2	50
Wives No Longer Listed, Husbands Enumerated In Their Own Names	23	19	83
Total	83	54	65

In all, 29 of the 83 unlisted husbands and wives − 35 per cent − could not be traced in the burial register. It is possible that the two disappeared husbands with wives listed in their own names (the third category) had either temporarily left Lyme Regis or abandoned their wives. However, all the families of the unlisted husbands and wives continued to reside in Lyme Regis, usually with their children, and given that most surviving spouses were enumerated in later schedules as widows or widowers, the evidence suggests that the great majority of missing husbands and wives had died between enumeration listings.

One important feature of Table 2.1 is the large number of missing husbands who were not registered in the burial register. It is possible that many of these died at sea − about a fifth of men were listed as mariners in the burial register during 1703-04 and in apprentice indenture documents in 1663-1725. Also it is possible that some of the missing burials were due to the "traffic in corpses", with individuals being buried outside their parish of

[46] The burial register used for this research is the manuscript copy deposited in the Dorset Record Office.

residence. However, it is unlikely that this could explain why it was mainly men who were missing from the burial register. Also, the Lyme Regis register often noted such burials − for example, the register recorded that on the 12th January, 1697 "Margaret Miller widow died in this parish but was buried at Musberry in Devon."

In the 1695 and 1698 Lyme Regis enumeration listings, a number of individuals were crossed out of the list with the capital letter D marked against their names, presumably because their families were liable to the tax on burials under the Marriage Duty Act. Of 22 such individuals, 13 were traced in the burial register, all in the year of the census − from the 1st May to the 30th April − the year defined by the Act. The other 9 cases were missing from the burial register, representing an omission rate of 39 per cent − very similar to that found for the missing husbands and wives in Table 2.1. It is unclear whether these 9 cases were all marked for payment of tax on burials, or were simply listed as dead. They could not be located in the 1703 listing and it is likely that they all died between 1695 and 1703, but it is unknown whether they were buried in Lyme Regis or not.

Of the 22 cases marked with the letter D, 11 were husbands, 7 were wives, 3 daughters and 1 a son of the families enumerated. 7 of the 11 husbands were missing from the burial register, 1 of the 7 wives, 1 of the 3 daughters, and none of the sons (the one son was registered). This again mirrors the finding in Table 2.1: husbands were much more poorly registered in the burial register than other members of the family, possibly as a result of being buried at sea or elsewhere outside of Lyme Regis.

Missing cases were not distributed evenly between the 1695 and 1698 enumeration listings: 11 of the 13 cases returned as dead in 1695 were found in the burial register, as against only 2 out of 9 in 1698. This indicates that the legal penalties for the non-registration of burials were taken much more seriously in the first year of the Act, and that the Lyme Regis clergyman and his clerk became much more lax in burial registration in the later period. This is compatible with what is known generally about the gradual deterioration of compliance with the Act during the eleven-year period that it was in force.[47]

---

[47] This was reflected in Swindon by the declining number of people enumerated in the listings − 747 in 1697, 649 in 1701 and 522 in 1702 − and most of the

How typical was the poor burial registration found in Lyme Regis? The evidence from Swindon is that in some other parishes it was very much better during this period. Of 25 husbands and wives who disappeared in Swindon during the period 1697-1702, leaving widows and widowers behind, 22 were found in the burial register.

Research on 47 Bedfordshire parishes tracking married couples in the 1841 and 1851 censuses, identified 32 wives and husbands enumerated in 1841 who had become widows and widowers by 1851. 30 of these 32 cases were traced in Anglican burial registers between 1841 and 1851,[48] indicating a high degree of burial registration reliability, even higher than that found in Swindon at the end of the seventeenth century.[49]

Comparison Of Probate Records With Parish Registers.

A further way of checking burial registration reliability is to compare information in probate records with that in burial registers, searching the parish register for the registration of the burial of the person leaving the will. The majority of wills give the parish of residence, although this is not necessarily the parish of burial, which is an issue that must be addressed when comparing probate records with burial registers.

Of 202 people leaving wills in Lyme Regis in the period 1664-1749,[50] 74 could not be traced in the burial register within five years previous to probate − an omission rate of 37 per cent. This is slightly higher than the proportion of missing burials found through the tracking of husbands and wives (35 per cent), but it is sufficiently similar to give some confidence in both methods of evaluating burial registration reliability.

---

missing individuals in later enumerations were children, as the number of families remained more or less constant.

48 For further details see Table 8.4, p. 202.

49 There is increasing evidence that parish registration in rural, predominantly Anglican areas, was of a high quality in the post-1837 period, and held up well until at least the second half of the nineteenth century. Personal communication from Andrew Hinde.

50 These probate records are deposited in the Dorset Record Office.

Information on wills is widely available, and it is possible to check registration reliability where both probate records and parish registers survive. Ideally we would want to evaluate both the burial registration of people leaving wills in their parish of residence, as well as in neighbouring parishes where a "traffic in corpses" might have taken place. This is possible for parishes in the county of Bedfordshire, where a digital transcript of Anglican and Non-Conformist burials − covering 355,985 individual entries − has been compiled for the whole county in the period 1538-1851.[51]

A published index of wills proved or administered in the Archdeaconry of Bedfordshire church court is available for the same period, giving information on name, parish of residence, occupation and date of probate.[52] People whose wills were administered by this court are likely to have only owned property in the county of Bedfordshire, as wealthy people owning wealth in more than one county frequently used Prerogative Courts for this purpose. Patricia Bell, the editor of published Bedfordshire wills, concluded that "local probate records relate to the more prosperous husbandman, yeomen, and tradesmen and their widows, and also to parish clergy and some minor gentry."[53] For people using the Bedfordshire court and only owning local property, this is likely to have reduced the incidence of a "traffic in corpses" outside the county.

This is confirmed by the analysis of parish of intended burial listed in Bedfordshire probate records: of the first 100 wills for the period 1510-23 with relevant information, 96 gave the parish of residence as the requested parish of burial.[54]

Thirteen Bedfordshire parishes were selected for intensive study, and were chosen for a project on infant and child mortality because of their high quality of information running from the

---

51 A copy of this digital transcript has kindly been made available by the Bedfordshire Family History Society for the current research.

52 J. Stuart and P. Wells (eds.), *The Index of Bedfordshire Probate Records 1484-1858*, Vol. 1 (The Index Library, British Record Society, 1993).

53 P. Bell, *Bedfordshire Wills 1484-1533* (Bedfordshire Historical Record Society), Vol. 76, 1997, p. 1.

54 *Ibid.* These are the Bedfordshire wills nearest to the parish register period which have been transcribed and published.

sixteenth through to the nineteenth century.[55] The parishes are as follows: Barton in the Clay, Bedford St. Mary, Chalgrave, Dunstable, Henlow, Houghton Regis, Husborne Crawley, Maulden, Milton Bryant, Sandy, Shillington, Toddington, and Woburn. The majority of the parishes are located in the south of the county, six of them on the edge of Bedfordshire and six of them partly contiguous to each other. The sample was constructed by selecting names beginning with the letters A to G, chosen from the index of Bedfordshire Probate Records. A name search was then made both in published Anglican burial registers and in the digital burial index.[56] In order to allow for date errors, a case was defined as traced when located in the burial register within five years previous to the date of probate. In order to trace a case in a neighbouring parish register, a search was only made to within one year before probate because of the greater difficulty of establishing correct identity. Phonetical variations were allowed for, and matching criteria were defined as widely as possible − such as a woman listed as a widow even without a forename − in order to minimize the risk of missing a traced case.[57]

---

55 See P.E. Razzell, 'Life and death in Bedfordshire: early research findings', *Bedfordshire Family History Society Journal,* Vol. 15 (2005).

56 No attempt was made to trace individuals in the digital non-conformist burial index, as the main purpose of the research was to assess the quality of Anglican burial registration.

57 Phonetical variations were examined manually, and any possible name variation was counted as a traced case. It is therefore likely that any false negatives would be more than balanced by false positives.

Table 2.2: People Named In Probate Records And Traced In Thirteen Bedfordshire Burial Registers, 1538-1849.

Period	*Total Number Of Individuals Named In Probate Records*	*Number Of Individuals Named In Probate Records Traced In Burial Registers*	*Proportion Of Individuals Named In Probate Records Traced In Burial Registers* *%*
1538-99	181	147	81
1600-49	292	249	85
1650-99	348	287	82
1700-49	405	343	85
1750-99	280	228	81
1800-49	241	197	82
Total	1747	1451	83

There was little variation in the proportion of untraced cases over time, and the overall average of missing burials was 17 per cent. 79 per cent of burials were found in the year of probate, 17 per cent in the previous year, 2 per cent two years before, and 2 per cent three to five years previous to the year of probate. Only 4 per cent of burials were located outside the parish of residence as stated in the will index.

It is not possible with present data to trace burials outside of Bedfordshire, but a comparison of the six parishes on the edge of the county with the seven inner parishes suggests that this is not a major problem. The proportion of untraced cases in the former is 16 per cent (148 out of 917), compared to the rate in the seven inner parishes − 18 per cent (148 out of 830).[58] However, the proportion of cases traced in adjacent parishes is slightly less in the outer parishes − 3.5% (27 out of 769) − than it is in the inner parishes − 4.3% (29 out of 682). Most outer parishes were surrounded by three or four other Bedfordshire parishes, and so the minimal differences between inner and outer

[58] The parishes on the edge of the county are Barton in the Clay, Dunstable, Henlow, Houghton Regis, Shillington, and Woburn; the inner parishes are Bedford St. Mary, Chalgrave, Husborne Crawley, Maulden, Milton Bryant, Sandy and Toddington.

parishes in the proportions of burials registered in other parishes is not surprising.

There are variations in the proportions of untraced cases by individual parish, and this appears to have been partly a function of population size.

Table 2.3: People Named In Probate Records And Traced In Thirteen Bedfordshire Burial Registers By Individual Parish, 1538-1849.[59]

Parish	*Proportion Of Individuals Traced In Burial Registers %*	*Proportion Of Individuals Traced In The Same Parish Burial Register %*	*Population Size In 1801*
Milton Bryant	94	92	333
Barton In The Clay	91	87	448
Chalgrave	78	70	534
Husborne Crawley	86	81	543
Henlow	90	88	552
Maulden	82	79	738
Houghton Regis	83	78	784
Shillington	88	87	899
Sandy	88	88	1115
Dunstable	72	71	1296
Toddington	77	72	1443
Woburn	83	77	1563
Bedford St. Mary[60]	74	71	[616]
Total	83	80	

[59] The number of individuals in the probate samples in different parishes is as follows: Milton Bryant: 53; Barton In The Clay: 118; Chalgrave: 82; Husborne Crawley: 108; Henlow: 92; Maulden: 121; Houghton Regis: 167; Shillington: 234; Sandy: 208; Dunstable: 174; Toddington: 191; Woburn: 133; Bedford St. Mary: 66.

[60] Bedford St. Mary was included in the largest population category because it was one parish amongst several in a large town.

There was a general association between the population size of a parish and its proportion of untraced cases, as indicated in Table 2.4.

Table 2.4: The Relationship Between Population Size In Thirteen Parishes And The Proportion Of Individuals Traced In Bedfordshire Burial Registers, 1538-1849.

Parish	*Number Of Individuals Named In Probate Records*	*Proportion Of Individuals Named In Probate Records And Traced In Burial Registers %*	*Proportion Of Individuals Named In Probate Records And Traced In The Same Parish Burial Register %*
Parishes With Populations Under 500	171	92	89
Parishes With Populations Between 500 And 700	281	85	80
Parishes With Populations Between 700 And 1000	522	85	82
Parishes With Populations Over 1000	773	80	77

Some of the sample sizes are not very large and in order to partly remedy this defect, three additional parishes with population sizes of less than 500 people − Little Barford, Bletsoe and Great Barford − were selected for analysis. Of 120 individuals establishing probate in these three parishes during the period 1538-1849, 15 − 13% − could not be traced in burials registers or the digital index. There were 29 untraced cases out of a total of 291 − 10 per cent − in the five parishes with populations of less than 500, exactly a half of the proportion of untraced cases in parishes with a population of over 1000. The reasons for variations in the proportions of traced cases in parishes of different population size will be discussed later.

There appears to have been little or no association between occupation and registration accuracy, as indicated in the following table.

Table 2.5: People Named In Probate Records And Traced In Thirteen Bedfordshire Burial Registers By Occupation, 1538-1849.

Occupation Listed In Probate Records	*Total Number Of Individuals Named In Probate Records*	*Proportion Of Individuals Named In Probate Records And Traced In Burial Registers* %	*Proportion Of Individuals Named In Probate Records And Traced In The Same Parish Burial Register* %
Gentlemen & Professional	67	85	76
Farmers & Yeomen	447	87	83
Artisans & Tradesmen	466	86	82
Labourers & Husbandmen	190	84	83
Widows & Spinsters	249	82	77

It might be expected that the poorer socio-economic groups such as labourers and husbandmen would be subject to less adequate burial registration, but this does not appear to have been the case. The finding of a slightly higher proportion of untraced cases amongst widows and spinsters is different from the findings on Lyme Regis, suggesting that there were special factors at work in the latter place. Table 2.5 also suggests that there was a tendency for gentlemen and professionals to be buried outside their parish of residence, whereas the reverse was true of labourers and husbandmen.

There is evidence for other areas of the country to suggest that adult burial registration was incomplete in the period before the end of the eighteenth century. The following table

summarizes research comparing probate records with information in individual parish registers.

Table 2.6: People Named In Probate Records And Traced In The Burial Registers Of Seven Individual Parishes.[61]

Parish And Period	*Total Number Of Individuals Named In Probate Records*	*Proportion Of Individuals Named In Probate Records And Traced In The Same Parish Burial Register %*	*Population Size In 1801*
Lyme Regis, Dorset, 1664-1749	232	65	1451
Hartland, Devon, 1598-1793	81	81	1546
Colyton, Devon, 1553-1773	124	72	1641
Great Dunmow, Essex, 1559-1602	50	80	1828
Long Melford, Suffolk, 1559-1610	97	79	2204
Newbury, Berkshire, 1546-1648	50	76	4275
Thaxted & Saffron Walden, Essex, 1560-1602	62	82	5075
Total	696	72	

[61] A search was made in the burial register for a period within five years before the date of probate. The parishes in Table 2.6 were selected in the course of other research. For example, the two parishes Colyton and Hartland were chosen because they were important in the Cambridge Group's reconstitution project. With the exception of Lyme Regis, all source material on probate records and burial registers is to be found in the Society of Genealogists' library.

The percentage of traced cases was lower in parishes in Table 2.6 than the equivalent proportion in Table 2.3 − on overall figure of 72 per cent compared to 80 per cent. This may have been partly due to most parishes in Table 2.6 being small towns − but there is no linear relationship between population size and proportion of burials traced. Most of the sample sizes in Table 2.6 are very small, and cover varying time periods, and only more systematic research will settle the issue of population size and burial registration accuracy.

In one respect the tracing of burials of people making or administering wills is a mild test of burial registration adequacy. People establishing probate were mostly adults − usually males − who owned property and were not from the poorest section of the community.[62] We would expect families of such people to ensure registration of their burials, particularly because of the legal implications of property transfers.

One way of analysing the burial registration of property owners and the poor is to compare the burials of will-leavers with that of paupers. Many parishes paid for the burial of the poor, including the purchase of coffins and carrying the dead to be buried. Lyn Boothman has carried out research on the parish of Long Melford in Suffolk. Of 97 people who left wills in 1559-1610, 20 could not be traced in the burial register (21%), compared to 34 of 52 paupers (65%) buried at about the same time.[63] Boothman has suggested that the very high omission rate amongst Long Melford paupers may have been a result of the non-payment of burial fees by the local poor law authority.[64]

Comparison of poor law and burial records that I have carried out for the two parishes of Whitchurch, Oxfordshire and Folkestone, Kent indicate that burial registration of paupers was of a similar level to that found amongst will-leavers.

---

62 See N. Goose and N. Evans, 'Wills as an historical source', T. Arkell, N. Evans and N. Goose (eds.), *When Death Do Us Part* (Oxford 2000).

63 Personal communication from Lyn Boothman.

64 L. Boothman, 'Letter on Long Melford parish registers', *Local Population Studies,* No. 50 (1993), pp. 80, 81.

Table 2.7: Comparison Of Information On Pauper Burials In Poor Law Records And Parish Registers.[65]

Place	*Period*	*Total Number Of Pauper Burials*	*Number Of Pauper Burials Traced*	*Proportion Of Burials Traced %*
Whitchurch	1651-1750	93	74	80
	1751-1800	68	53	78
Folkestone	1732-1751	57	47	82
	1752-1787	57	51	89

The range of omission rates − from 11 to 22 per cent − is similar to that found among will-leavers in Table 2.3, suggesting that wealth in these two parishes was not an important factor in burial registration reliability.

Discussion

A number of questions is raised by the findings summarised in Tables 2.1 − 2.7. Perhaps the most important is what factors accounted for the under-registration of burials in the parish register period? Wrigley and Schofield have presented figures for different components of death under-registration, which have been summarized by Jeremy Boulton as follows:

65 Razzell, *Essays in Population History*, pp. 211-12.

Table 2.8: Components Of Death Under-Registration In England, 1630-1799.[66]

Date	*Overall Under-Registration*	*Estimated Components Of Under-Registration*		
	%	*Religious Dissent* *%*	*Delayed Baptism* *%*	*Residual* *%*
1630-39	0.0	-	-	-
1640-49	0.2	50	-	50
1650-59	0.8	51	-	49
1660-69	1.2	52	-	48
1670-79	1.8	50	2	48
1680-89	2.5	43	15	42
1690-99	3.2	35	26	40
1700-09	3.7	28	35	37
1710-19	4.2	24	40	36
1750-59	6.7	12	59	29
1790-99	16.5	7	40	53

Burial under-registration due to delayed baptism is not relevant to adult burials, but the other two components in Table 2.8 − religious dissent and residual − are applicable. However, perhaps the most striking feature of the table is the zero amount of overall burial under-registration in the 1630s, and the relatively negligible extent of under-registration in the period up to the middle of the seventeenth century.

Wrigley and Schofield assumed that no inflation of burials was necessary for the effects of religious non-conformity and residual causes on non-registration in the period 1538-1640, but that by 1810-19 it was necessary to increase burials by 48% to account for these forms of under-registration.[67] These assumptions are in strong contrast to the findings derived from the comparison of probate/ burial data summarized in Table 2.2, where there is a significant amount of burial under-registration in the seventeenth

66 Boulton, 'The Marriage Duty Act', p. 224.

67 Wrigley and Schofield, *The Population History*, pp. 545-552.

and first half of the eighteenth century, not dissimilar in amount to that found subsequently.

It is possible to clarify one of the components in Table 2.8 − religious dissent − by analysing the non-conformist registers that have survived for Bedfordshire and been included in the Bedfordshire Family History Society's burial database.

Table 2.9: Non-Conformist Burial Registers, Bedfordshire Family History Society's Database, 1538-1850.[68]

Place	*Denomination*	*Period*	*Number of Burials*
Ampthill	Methodist	1817-41	27
Ampthill	Quaker	1707-1847	112
Bedford	Bunyan Meetinghouse	1846-50	93
Bedford	Congregational	1785-1836	38
Bedford	Howard Church	1790-1837	147
Bedford	Primitive Episcopalean	1834-45	62
Bedford	Protestant Dissenters	1837-50	87
Bedford	Moravian	1746-1850	510
Biggleswade	Baptist	1786-1829	3
Biggleswade	Methodist	1835-50	26
Biggleswade	Protestant Dissenters	1727-1786	2
Blunham	Baptist	1739-1850	99
Cranfield	Baptist	1794-1837	97
Hockliffe	Congregational	1817	1
Houghton Regis	Baptist	1794-1837	18
Leighton Buzzard	Baptist	1771-1850	98
Leighton Buzzard	Quaker	1826-50	44
Little Staughton	Baptist	1786-1806	22
Luton	Baptist	1837-50	397
Luton	Quaker	1776-1850	115
Maulden	Independent	1785-1834	32
Southill	Baptist	1802-20	9
Stevington	Baptist	1830-50	43
Turvey	Congregational	1848-50	6
Woburn	Congregational	1790-1837	75
Woburn Sands	Quaker	1704-1850	66
Total			2501

[68] The registers on which the database is based are those copied or transcribed and deposited in the Bedfordshire Record Office.

The above table includes nine registers not covered by the Registrar-General's list of deposited registers published in 1859, and is likely to include all surviving Bedfordshire non-conformist burial registers.[69] The majority of these registers begin in the late eighteenth and early nineteenth century. Only four of the thirteen parishes in the Bedfordshire sample have surviving registers: Bedford, Houghton Regis, Maulden and Woburn. There were several non-conformist denominations in the town of Bedford, and there were a substantial number of burials − 510 − in the Moravian register between 1746 and 1850. Burials included in the registers for the three other parishes were insignificant in number: 18 in the Houghton Regis Baptist register between 1794 and 1837, 32 in the Maulden Independent register in the period 1785-1834, and 66 in the Woburn Quaker register between 1704 and 1850. The number of burials in the Bedford non-conformist registers could be an important factor in Anglican under-registration in that town, but it appears that religious dissent played an insignificant role in the other twelve parishes of the Bedfordshire sample.[70]

The remaining residual component of burial under-registration probably relates to clerical negligence and registration problems such as the non-payment of fees. In the sixteenth and seventeenth centuries, many of the thirteen sample registers had annual gaps in the registration of burials, even after many years of regular registration. However, there was a significant change over time in the occurrence of annual gaps. In the period 1538-1649, 32 per cent of untraced probate cases were the result of yearly gaps in the burial register, whereas after 1700 there were none. This suggests that burial registration improved during the late seventeenth century, but the evidence summarized in Table 2.2 indicates otherwise. Much burial under-registration was probably

---

69 See *Bedfordshire Notes and Queries*, Vol. 3, 1890-92 (Bedford 1893), pp. 199-202. The registers in Table 2.9 not covered by the Registrar-General's list are: Ampthill Methodist, Bedford Bunyan Meetinghouse, Bedford Primitive Episcopalian, Bedford Protestant Dissenters, Biggleswade Protestant Dissenters, Hockliffe Congregational, Leighton Buzzard Baptist, Little Staughton Baptist, and Maulden Independent

70 The non-conformist churches in Bedford probably served a wide hinterland covering a number of rural parishes as well as the town itself, but none of the other twelve parishes in the Bedfordshire sample were either adjoining or within a radius of ten miles of the town.

the result of systematic clerical negligence, as indicated by Burn in his study of parish registers, first published in 1829:

"The custody of parish registers having been frequently committed to ignorant parish clerks, who had no idea of their utility beyond their being occasionally the means of putting a shilling into their own pockets for furnishing extracts, and at other times being under the superintendence of an incumbent, either forgetful, careless of negligent, the result has necessarily been, that many Registers are miserably defective, some having the appearance of being kept from month to month, and year to year, yet being deficient of a great many entries."[71]

This clerical negligence appears to have been present from the sixteenth century onwards. For example, "in 1567 the incumbent of Tunstall, Kent, appeared to have tired of registering the Pottman family because of its concentration in the parish and simply stated in the register: 'From henceforwd I omit the Pottmans.'"[72]

As previously mentioned, some of the neglect of burial registration was due to the non-payment of fees. In the Northamptonshire parish of Brington, "the very true reason why this register, is found as imperfect in some years as from 1669 to 1695 is because the parishioners could never be persuaded to take to see it done, not the church-wardens as ye canon did require, and because they refuse to pay such dues to ye curate as they ought be custome to have payed."[73]

In 1702-03 "a committee of Convocation drew up a list of ecclesiastical offences notoriously requiring remedy, in which irregularity in keeping registers is prominent in the list of gravamina."[74] Evidence for clerical negligence became abundant in the early nineteenth century. The *Gentleman's Magazine* remarked in 1811 that "the clergyman (in many country places) has entered the names at his leisure, whenever he had nothing

71 J.S. Burn, *The History of Parish Registers in England* (London 1862), p. 18.

72 *Ibid*, p. 41.

73 J.C. Cox, *The Parish Registers of England* (London 1910), pp. 20, 21.

74 W.E. Tate, *The Parish Chest* (Cambridge 1969), p. 49.

better to do, and perhaps has never entered them at all."[75] The *Report of the Select Committee on Parochial Registration in 1833* provided substantial evidence on the reasons for defective parish registration. One of the witnesses, Mr William Durrant Cooper, a solicitor, had extensive experience of tracing individuals in parish registers for property cases, and concluded that parish registration was "exceedingly defective … [with] a very large number of marriages, deaths and baptisms not entered at all … especially deaths."[76] To illustrate this, he gave the following example:

"On the sale of some property [in 1819] from Mr Cott to Lord Gage, it was necessary to procure evidence of the death of three individuals, Mrs Pace, Mr Tuchnott and Mrs Gouldsmith. They were at different places, all in Sussex; Mrs Pace was regularly entered; Mr Tuchnott was buried at Rodmell, about five miles from Lewes, and on searching for the register of burial we found no entry whatever. On making an inquiry in the churchyard of the sexton, he stated he recollected digging the grave, and the ceremony being performed; Mr Gwynne, the rector, whose neglect in that and other parishes is well known, had omitted to enter it … Mrs Gouldsmith, who was buried at Waldron, in the same county, was not entered, but on going to the parish clerk, who was a blacksmith, he stated he recollected the circumstance, and accounted for her burial not being entered in this way: he said it was usual for him, and not the clergyman, to take account of the Burials, and he entered them in a little sixpenny memorandum book … If it so happened that the fee [of one shilling] was paid at the time, as was the case with affluent persons, no entry would appear in his book, he only booked what was due to him, and as the clergyman entered the parish register at the end of the year from his book, and not at the time of the ceremony, all burials that were not entered in his book would not find their way into the register."[77]

---

75 Burn, *The History of Parish Registers.*, p. 42.

76 *Report of the Select Committee on Parochial Registration*, (Parliamentary Papers, 1833/ XIV), p. 24.

77 *Ibid,* p. 25.

This evidence suggests that clerical negligence was the main reason for the non-registration of Anglican burials. However, if this were the case, we would expect baptism registration also to be subject to the same process of under-registration. The earlier evidence on baptism and child burial registration indicates little or no linear trend over time, similar to the findings for the same period on adult burial registration depicted in Table 2.2. The proportion of untraced births is higher than the percentage of missing adult burials, and this may be for a variety of reasons − including the different socio-economic characteristics of the samples − but may be partly a function of population size.

Table 2.10: Proportions Of Untraced Births By Population Size Of Parish, 45 Parishes, 1761-1834.[78]

Population Size In 1851	*Total Number of Cases*	*Proportion Of Untraced Births %*
Under 500 (9 Parishes)	579	19
500-999 (7 Parishes)	638	15
1,000-1,499 (9 Parishes)	2,003	28
1,500-1,999 (10 Parishes)	2,383	31
2,000+ (10 Parishes)	5,351	36
Total	5,351	31

The proportions of untraced cases in the smaller parishes is significantly less than those in the larger parishes, a similar finding to that for adult burial registration summarized in Tables 2.3 and 2.4.[79] If many clergymen only compiled their registers sporadically or even at the end of the year as suggested by the anecdotal evidence quoted above, the larger the parish the more likely they were to forget or neglect the registration of marriages, baptisms and burials. This hypothesis will have to be evaluated through further research on much larger samples, and will perhaps

78 Razzell, *Essays in English Population History,* p. 94.

79 The proportions of untraced births in Table 2.10 are larger than the equivalent figures in Table 2.3 and 2.4, but the samples are for different parishes and were selected from the general population for the former, as well as having different socio-economic characteristics.

have to include the study of legal records, diaries, autobiographies and other local historical sources.

Conclusion.

The present essay has illustrated the application of nominal record linkage methodology to the measurement of adult burial registration. The evidence from this research suggests the following conclusions: 1. Burial registration was deficient in all periods between 1538 and 1851. 2. Burial registration of adults was worse in larger than smaller parishes. 3. Socio-economic status appears to have had little or no influence on the quality of burial registration of adults. 4. Religious dissent played an insignificant role in Anglican burial under-registration, which was caused mainly by clerical negligence.

The above conclusions are necessarily provisional, given the small number of parishes covered by the research. However, demographic data by its very nature lends itself to the analysis of registration reliability, particularly where it is possible to 'triangulate' sources such as in the case of Lyme Regis. The availability of a wide range of digital sources − the baptism and marriage registers transcribed by the Church of Jesus Christ of Latter Day Saints (Mormons), the digitisation of burial registers by local family history societies, and the computerisation of the national censuses of England between 1841 and 1901 − will allow research on a large number of parishes.

Methodological work on these digital sources will be a prelude to a new research, not based on 'model-down' reconstruction of national data, but derived from detailed and meticulous local evidence including both quantitative and qualitative source material. These developments will allow comprehensive research on parishes from a wide range of places and counties, and should allow in due course confident general conclusions about the population history of England in the parish register period.

II

The Structure Of Population Change

3. REVIEW OF E.A. WRIGLEY *ET. AL.*'S *ENGLISH POPULATION HISTORY FROM FAMILY RECONSTITUTION 1580-1837*. [80]

Introduction

This volume is published in the Cambridge Studies in Population, Economy and Society in Past Times series, and brings to fruition a project spanning more than thirty years, involving the collaboration of many different individual scholars, both amateur and professional. The Cambridge Group is an Economic and Social Research Council Unit and its work has found such wide acceptance that it has almost achieved official recognition.[81]

The basis of these achievements is the collection of nearly four million individual entries from 404 parish registers, as well as the linkage of detailed material for 26 reconstitution studies. By generating detailed information on nuptiality, fertility, mortality and population structure, the Cambridge Group has made a significant contribution to the development of historical demography, which in turn has had a major influence on a number of other disciplines, including economic, social and medical history.

The Cambridge Group has analysed its data by means of elaborate computer programs. Much of this work appeared in the 1981 volume written by Wrigley and Schofield − *The Population History Of England, 1541-1971* − which mainly concentrated on the results of the aggregative work, using in part the back projection technique.[82] The results are sufficiently familiar not to require detailed discussion here. The main findings

---

80 The authors of this book are E.A. Wrigley, R.S. Davies, J.E. Oeppen and R.S. Schofield and it was published in 1997. This essay first appeared in the *Social History of Medicine*, Vol. 11 (1998).

81 The leading member of the group − Professor Wrigley − has received a knighthood for his contribution to historical demography, and been awarded a gold medal by the International Union for the Scientific Study of Population for his scholarly achievements in the field of population studies.

82 See E.A. Wrigley and R.S. Schofield, *The Population History Of England, 1541-1871* (London 1981). A second edition with a new introduction was published in paperback in 1989.

were that after a period of stagnation in the second half of the seventeenth and first half of the eighteenth century, population began to grow rapidly after the middle of the eighteenth century. Most of this population growth was interpreted as being due to a rise in fertility, resulting from a fall in the average age at marriage of about three years. Changes in mortality were seen as being more modest, with relatively slight falls in child and adult mortality after the middle of the eighteenth century. Wrigley and colleagues estimate in their latest volume that about two-thirds of eighteenth century population increase was due to rises in fertility, and one third to decreasing mortality.[83]

These findings have been interpreted by the authors as largely confirming the work of Robert Malthus. They have argued that the growth of population was the result of the increase in fertility associated with a fall in the age of marriage, which in turn was probably due to growing real incomes lagged over time. Most of these conclusions are based on the aggregative data collected from the 404 parish registers, although they were supported by the early findings of thirteen reconstitution parish register studies published in 1981. Although these findings and conclusions have found wide acceptance, some of the methods used by the Cambridge Group have come under scrutiny and there has been an extensive discussion of the problems of reconstitution methodology.[84]

Central features of the Cambridge Group's main argument have been challenged within the last few years. For example, Peter Lindert has questioned the way Wrigley and Schofield used Registrar-General's nineteenth century data to estimate birth registration patterns. Lindert concluded that "life tables and nineteenth century censuses suggest that birth

---

83 E.A. Wrigley, R.S. Davies, J.E. Oeppen and R.S. Schofield, *English Population History from Family Reconstitution 1580-1837* (Cambridge 1997), p. 126.

84 See T.H. Hollingsworth, *Historical Demography* (London 1976), pp. 181-196. A brief bibliography of work examining the problems of reconstitution methodology is given in Steven Ruggles, 'Migration, marriage, and mortality: correcting sources of bias in English family reconstitutions', *Population Studies*, Vol. 4 (1992), p. 507, fn. 1. The Cambridge Group has fully participated in this debate: see R.S Schofield, 'Representativeness and family reconstitution', *Annales De Demographie Historique*, 1972 (Paris 1972), pp. 121-125, and the discussion which followed, *Ibid*, pp. 127-146.

registration was worse before 1780 than after. Yet Wrigley and Schofield turn the suggestion upside down, arbitrarily revising the censuses instead."[85]

The revisions to which Lindert refers were a part of the Cambridge Groups back projection program, involving a range of assumptions and adjustments which could have a major effect upon key conclusions.[86] The most important adjustments were those made to aggregate numbers of baptisms and burials, and (as with so much of the Cambridge Group's work) these were made on the basis of complex sets of demographic assumptions and calculations rather than on the direct examination of empirical sources.

For example, Wrigley and Schofield in their back projection program inflated baptisms by certain ratios in order to calculate the number of births in England & Wales. These ratios were based on estimates of unregistered births which can be contrasted with empirically derived figures calculated from census/ baptism register research discussed previously.

---

85 P.H. Lindert, 'English living standards, population growth, and Wrigley-Schofield', *Explorations in Economic History*, Vol. 20 (1983), p. 136.

86 For example, as a part of the back projection programme, Wrigley and Schofield reduced the size of the age group enumerated in the 1871 Census by 44 per cent; if they had chosen instead to reduce that age group by 40 per cent, their estimate of the English population in 1541 would have been about 9 per cent greater. See R.D. Lee and D. Lam, "Age distribution adjustments for English censuses, 1821 to 1931", *Population Studies*, Vol. 37 (1983), pp. 445-464.

Table 3.1: The Cambridge Group's Estimate Of Unregistered Births In England & Wales, Versus Individuals Listed In The 1851 Census But Not Found In The Baptism Register, 1761-1834.[87]

Period	*Wrigley & Schofield's Estimates Of Unregistered Births In England & Wales, (%)*	*Percentage Not Found In Baptism Registers (Razzell)* *%*
1761-1770	13.5	32.4
1771-1780	14.6	27.9
1781-1790	17.9	32.6
1791-1800	23.2	36.0
1801-1810	27.6	32.0
1811-1820	32.3	33.0
1821-1830	29.9	30.0
1831-1834	26.2	27.4

The census/ baptism register figures show little or no trend over the period, with approximately a third of all births missing from the baptism registers. Although these figures do not support Lindert's contention that birth registration was worse before 1780 than afterwards, they are significantly at variance from Wrigley and Schofield's estimates of unregistered births. Their figures show a marked deterioration in birth registration at the end of the eighteenth century, whereas the census/baptism register data indicate a more-or-less stable level of registration accuracy.

Without their inflation ratios, Wrigley and Schofield's data indicates a constant level of fertility at the end of the eighteenth and beginning of the nineteenth centuries, as indicated by their crude baptism and burial rates.

[87] See Wrigley and Schofield, *The Population History*, pp. 543, 544; Razzell, *Essays in English Population Studies*, p. 95.

Table 3.2: English Baptism And Burial Rates (Per 1000) Calculated From Cambridge Group Data.[88]

Period	Estimated Population	Baptism Rate	Burial Rate
1701-40	5,350,000 (1721)	29.3	27.7
1741-80	6,147,000 (1761)	29.8	25.5
1781-1820	8,664,000 (1801)	29.4	20.6

The baptism rate was more-or-less constant between 1701 and 1820, whereas there was a significant fall in the burial rate during the same period, particularly at the end of the eighteenth and beginning of the nineteenth centuries. As we have seen previously, Wrigley and Schofield inflated the number of baptisms in 1781-1820, in the belief that the growth of religious non-conformity and other factors led to a decline in the quality of birth registration at the end of the eighteenth century, and it was on the basis of this inflation that they argued that there was an increase in fertility. Earlier evidence cited suggests that this inflation of baptisms is not warranted, and that there were no major changes in parish register reliability during the eighteenth and early nineteenth centuries.

Gregory King's work on the age structure of the English population in 1695 indicates that it was similar to that in 1821 based on national enumeration returns.[89] This data along with the evidence summarized above suggests that there was no significant long-term change in fertility, and that a reduction in mortality was the major factor in bringing about population growth in the eighteenth and early nineteenth century. However given the uncertain quality of the national data, it is necessary to evaluate

88 For the sources of data on which this table is based, see Wrigley and Schofield, *The Population History*, pp. 541, 543, 549, 551, 577.

89 D.V. Glass, 'Gregory King's estimate of the population of England and Wales, 1695', D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography* (London 1965), p. 215.

this conclusion by a detailed examination of reconstitution and other local evidence.

Reconstitution Methodology

The technique of family reconstitution has been practised by historical demographers for over eighty years,[90] and was developed in England by Wrigley with his pioneering work on Colyton.[91] The technique involves the nominal record linkage of data from baptism, marriage and burial registers, tracing individuals wherever possible from birth through to marriage and death. Standard rules are constructed so that record linkage is established in an objective manner, although the application of these rules depends very much on the quality of data available.[92]

Reconstitution methods can only be applied to people who stayed in the parish of their birth, allowing calculation of marriage ages, fertility and mortality rates. This means that migrants are excluded from reconstitution calculations, as they simply leave the field of observation (the parish and its register) to marry, have children and die elsewhere. This is generally recognised as a major problem for reconstitution studies, although the extent of the problem varies from one type of calculation to another.[93] The problem is particularly severe in calculating age at marriage and adult mortality, as these involve tracing people from birth through to marriage and eventual death. In order to calculate

---

90 Wrigley *et.al*., *English Population History*, p. 3.

91 See E.A.Wrigley, 'Some problems of family reconstitution using English parish registers: the example of Colyton', *Proceedings of the Third International Conference of Economic History*, Munich 1965, Section VII, Demography And Economics (Paris 1972), pp. 199-221.

92 One central principal of reconstitution work is that the period at risk in which a demographic event takes place is established independently of the event itself. For example, in order to calculate child mortality rates, it is important that the period in which the child is at risk of dying is established independently (through for example the baptism of another child in the family) of the date of the death of the child itself. Otherwise the calculated mortality rate would be affected by the exclusion of children who lived and did not die in the period in question.

93 For a discussion of some of these problems, see Ruggles, 'Migration, marriage and mortality', pp. 507-522.

adult mortality rates, reconstitution rules assume that adults enter observation at marriage. Age at marriage is measured through tracing an adult's baptism date and subtracting it from his or her marriage date. Adults are then deemed to be in observation until the occurrence of the last known independent event establishing their presence in the parish, such as the burial of a wife or husband.

As early as 1969, T.H. Hollingsworth questioned a number of the assumptions and procedures of reconstitution research. His criticisms may be summarised as follows: (1) Due to migration from parish to parish, the proportion of the total population included in reconstitution samples is very small, in some instances barely reaching 10 per cent. (2) Parish registers are of unknown reliability, but in England are likely to have been very defective during most of the parish register period. (3) There are special problems with the measurement of adult mortality, because of the difficulty of tracking adults to advanced ages. (4) There are difficulties with the calculation of infant mortality because of the delay between birth and baptism, in which period much infant mortality took place.[94]

Hollingsworth argued that many parish registers were very defective even as early as the seventeenth century, and cited the example of the parish of Ottery St. Mary, where the registration of burials at the end of the seventeenth century varied greatly depending on whether or not the vicar took personal responsibility for compiling the parish register.[95] It has been generally accepted that parish registration was very defective in individual parishes, but the problem is the lack of systematic knowledge of registration deficiency in the reconstitution parishes. This is a topic which I will return to later, but before this discussion, it is necessary to consider the nature of the Cambridge Group's reconstitution sample and its representativeness.

94 Hollingsworth, *Historical Demography*, pp. 181-196.

95 *Ibid*, pp. 191, 192.

The Cambridge Group's Reconstitution Sample

Twenty-six parishes are included in the Cambridge Group's demographic sample, and they were chosen primarily on the basis of two criteria: (i) the availability of volunteers to extract data; and (ii) the selection of parish registers with sufficiently large numbers to enable detailed reconstitution analysis by individual parish.[96] Although at first glance the latter appears to be a reasonable requirement, it has introduced a selection bias. Wrigley and colleagues have described the nature of their sample as follows:

"The twenty-six [parishes] were considerably larger on average than normal. Assuming for simplicity that there were 10,000 parishes in England in 1801, the national average parish size was about 860, or only 40 per cent of 2,187, which was the mean size of the 26 reconstitution parishes. There were some small parishes in the 26, but the difference in size is marked. Although by 1801 the average size of an English parish was about 860 souls, for the bulk of the parish register period a more representative figure would be about 500."[97]

I will argue later that the unrepresentative character of the sample − in which the parishes studied are about two-and-a-half times the size of the national average − is an important weakness as far the results of the research are concerned, particularly with regard to changes in mortality.

Wrigley and colleagues have divided the overall sample into four groups depending on availability of reliable data, and these overlap in time: there is no one period in which all 26 parish registers are included in the reconstitution analysis. Group 1 covers the period 1580-1729 (15 parishes); Group 2: 1600-1729 (20 parishes), Group 3: 1680-1789 (18 parishes) and Group 4: 1680-1837 (8 parishes).[98] The core groups are 2 and 3 which include the majority of parishes for the period 1600 to 1789, but

96 Wrigley *et.al*., *English Population History*, pp. 20, 21.

97 *Ibid*, p.20.

98 *Ibid,* p.26.

even here there are only 12 parishes which run throughout the whole period.

The sample of parishes covering the period 1680-1837 presents a major difficulty. As a result of the exclusion of parishes on the grounds of register unreliability, there are only eight registers in this group. This means that there are only eight parishes covering 1790-1837, an important period, for it is data from this group of parishes which is compared with census and civil registration data for 1831 and 1838-44 to assess the overall reliability of reconstitution findings.[99]

Ten parish registers were eliminated from group 3 on grounds of unreliability. The process of exclusion was not based on any independent or objective test, but on the basis of judgement and overall assessment of quality of data. Parish registers were mainly excluded because of the unreliability of their burial registration. Since this is so critical for the study of mortality, it is necessary to quote at length the reasons given for excluding particular parishes. I list the comments in the sequence they are given in *English Population History From Family Reconstitution*:

"*Aldenham*: ... there was ... an exceptionally sharp drop in infant mortality between 1750-99 and 1800-49 (from 141 to only 57 per 1000). The available evidence suggests that a substantial under-registration of deaths must have occurred and 1789 was chosen as the closing date for Aldenham.
Austrey ... The case of Austrey resembles Aldenham though the deterioration of burial registration appears to have occurred earlier. As with Aldenham the number of burials fell sharply, though not so sharply as to justify in itself the conclusion that the register had become unreliable. But since the level of infant mortality also fell to an implausibly low level (from 110 per 1000 in 1700-49 to 47 per 1000 in 1750-99) it seemed prudent to disregard the post-1750 period.
Bridford ... Bridford like Austrey, was a small parish with fewer than 500 inhabitants in 1801. Their registration histories were similar. The completeness of burial registration appears to have deteriorated in Bridford towards the end of the eighteenth century, and there was at the same time an apparent fall in infant mortality,

---

99 Wrigley *et.al*., *English Population History,* pp. 93, 95.

though less marked than in the case of Austrey. The decline was however heavily concentrated in the early months of life. Taken together these signs of deficiency suggest that the reconstitution post-1750 is significantly less complete than earlier.
Colyton ... there appears to have been a weakening in burial coverage towards the end of the eighteenth century. It therefore seemed prudent to use 1789 as the stopping date.
Earsdon ... there was probably a marked deterioration in registration towards the end of the eighteenth century ... between the half-century 1750-99 and the succeeding period 1800-41 ... Infant mortality fell from 126 per 1000 to 66 per 1000, while there was a simultaneous significant decline in age-specific marital fertility rates, a combination of changes that suggests that the reconstitution data should not be accepted after the end of group 3 period [1789].
Hartland ... infant mortality, which was little under 100 per 1000 in 1700-49, fell to 55 per 1000 in 1750-99, and still further to 36 per 1000 in 1800-37. Hartland lay in an area that enjoyed exceptionally low infant mortality, as the returns for the early years of civil registration clearly show ... There is therefore nothing implausible in the early eighteenth century level of infant mortality revealed by reconstitution, but its subsequent apparent fall must reflect deteriorating registration. It would therefore be foolhardy to include the period after about 1770.
Southill ... experienced ... a particularly acute form of abrupt worsening in burial registration after the 1780s, which suggests 1789 as a closing date.
Terling ... the number of burials over the ... decades [1770-9 to 1820-9] changed so implausibly as to cause distrust of any tabulations based on data after 1789 (107, 131, 96, 113, 65, 84)."[100]

The language used in these passages to justify the exclusion of data – "plausibility", "mistrust", "foolhardy", "suggests" – indicates the subjective nature of the process. Although Wrigley and colleagues apply objective tests elsewhere to the overall reliability of reconstitution data, these are not used for decisions about the exclusion of particular time periods from individual

[100] Wrigley *et.al*., *English Population History,* pp. 32-38.

parishes. One of the strengths of reconstitution methodology is that it states its assumptions and procedures in advance, so as to avoid the necessity of subjective judgement. In the present instance, the Cambridge Group have not followed this procedure, leaving themselves open to the criticism of "shaping" their findings to fit preconceived notions.

The Reliability Of The Cambridge Group's Reconstitution Data.

Wrigley and his colleagues are aware of the critical importance of the reliability of their data, and as we shall see, make a general overall assessment of the quality of their findings. One of the chief methods that they use in assessing data quality, is to compare their findings for the period 1825-37 with civil registration returns for the period 1838-44. The latter data is available for registration districts, allowing only a comparison between parishes and the civil registration districts in which they lie. The chief comparison that the Cambridge Group makes is for infant and child mortality, and the overall average rate for all age groups is about 15 per cent higher in the registration districts than it is in the parishes,[101] a not insignificant difference.

Wrigley and colleagues also compare the figures for the eight parishes with the Registrar-General's national statistics of infant and child mortality. Infant mortality was about the same in the eight parishes as it was nationally in the late 1830s − about 150 per 1000 − whereas child mortality was about 95 per 1000 in the reconstitution sample, and 130 per 1000 in England and Wales.[102] Wrigley *et.al.* argue that these figures indicate that the reconstitution sample is reasonably representative,[103] but this is questionable given the scale of difference in the child mortality rate. Also, had the data from the excluded parishes been included in the Cambridge Group's calculations there would be a sharp variation between reconstitution and national infant and child mortality rates. Infant mortality was 104 per 1000 and child mortality 72 per 1000 for the full nineteen parish sample during

101 Wrigley et.al., *English Population History* p. 93.

102 *Ibid*, p. 216.

103 *Ibid,* p. 217.

the 1830s, the former about two-thirds, and the latter nearly half the national rate in the same period, very significant differences.[104] The critical question thus becomes, what was the pattern of reliability of parish register data in the pre-1837 period?

Wrigley and colleagues attempt to answer this question by applying a test involving the comparison of birth intervals of different types of families. The logic of the argument is as follows: (i) Most mothers breast-fed their children in England in the early modern period, and breast-feeding is known generally to delay the further conception of children for periods of up to a year or more. (ii) When a child dies in the first year of life, the mother will become more fertile as a result of ceasing to breast-feed, making it possible to detect the presence of a dead child by the pattern of subsequent birth intervals. (iii) Registration reliability can be measured by comparing the pattern of birth intervals of families with (a) children known to have died in the first year, with (b) those known to have died subsequently, as well as with (c) the group where the date of death is unknown.

The argument is that it is the third group (of unknown dates of death) which would contain unregistered infant burials, and if it did contain such deaths its birth interval pattern would be more like the first group (with infant deaths) than the second (with non-infant deaths). Wrigley and colleagues make a number of complex calculations, and conclude that except for an early period before 1600, when perhaps nearly 30 per cent of all infant deaths were missing in the parish register, burial registration reliability in the reconstitution sample was very high.[105]

There are a number of problems with this method of assessing parish register reliability:

(1) The practice of breast-feeding of sufficient duration to delay birth intervals by one year is assumed rather than measured.

(2) It is also assumed that a mother's fecundity is independent of the health of her children. As one leading authority on the subject has recently written: "the child's death might be related to some characteristics of the mother which are not independent of her own fecundity: for example, severe malnutrition can lead to a lower

---

104 I am grateful to Jim Oeppen for providing the data on which these figures are based.

105 Wrigley *et.al*., *English Population History*, pp. 101-106.

fecundability or a longer period of anovulation for the mother."[106] A shorter birth interval is not therefore necessarily measuring the cessation of breast-feeding as a result of an infant death, but it might be measuring the opposite: a healthy and fecund mother with children less prone to infant mortality. And in practice, it might be measuring a combination of both.

(3) Using birth intervals to measure parish register reliability also assumes that the accuracy of death and birth registration are independent of each other. If there is a correlation between the two, as is likely (through the influence for example of financial status on registration practices), then birth intervals might be longer in the "unknown deaths" category not because of the cessation of breastfeeding due to infant death, but as a result of deficient birth registration in the "unknown" category.

All these problems illustrate the difficulty of using abstract and statistical methods for correcting and processing data. The issues dealt with are so complex, and involve so many unknowns and uncertainties, that the resulting data is subject to a large margin of error. One solution to the problem is to measure as directly as possible the reliability of parish registers by cross-matching them with alternative forms of information. Although Wrigley and colleagues engage in a limited exercise of comparing census with baptism register data,[107] they reject the possibility of evaluating parish registers generally through cross-matching alternative forms of data, believing there is insufficient reliable independent information for this purpose.[108]

In fact, as we have seen, there is a range of sources allowing an independent evaluation of parish registers − reconstitution same-name evidence, probate and poor law records − and the conclusions about parish register reliability using this data are very different from those reached by the Cambridge Group.[109]

---

106 H. Leridon, 'Fecundability and post-partum sterility: an insuperable interaction?', R. Gray *et al*. (eds.), *Biomedical and Demographic Determinants of Reproduction* (Oxford 1993), p. 246.

107 Wrigley *et.al*., *English Population History*, pp. 109, 110.

108 *Ibid*, pp. 91, 92.

109 See Essays 1 and 2.

Applying The Same-Name Method To Reconstitution Data.

Wrigley and colleagues have raised a number of questions about the validity of the same-name method as follows:[110]
(1) There is some evidence that living children were given the same name, invalidating the assumption that all first same-name children were dead.
(2) Names were often given in colloquial form, making it difficult to recognise identical names, e.g. Meg, Marg, Margaret.
(3) The extent of same-naming may have decreased over time, distorting the pattern of same-names found in the burial register.

Wrigley and colleagues used evidence from my own work to argue the first point, quoting my finding from sixteenth century Essex wills that 0.5 per cent of living siblings shared the same name. What I had not realised when I originally cited this evidence, is that living siblings with the same names might have been from two different marriages, remarriage of widowers and widows being very common in this period. The only reliable evidence on living same-name siblings is from enumeration listings which give information on relationship to the head of household. Extensive evidence from this source summarized previously reveals no cases of living same-name siblings.

The problem of colloquial name variations is not a problem for the same-name method. Only exactly identical names should be selected for analysis, and any name variants should be excluded. In practice very few colloquial same-names occur, and as long as identical same-name cases are sufficient in number to represent an adequate sample, there is not a significant problem.

On the issue of the proportions of families that resorted to same-name practices, the evidence is that there was no linear pattern over time. (See Table 1.2, p. 9). There was some increase in the proportion of eligible children in the early period and decline in the later one, but for most of the parish register period, between a half and two-thirds of all eligible families gave their children same-names. And as we will see, there is no obvious correlation between this pattern of same-naming and changes in burial registration reliability as measured by the same-name method.

---

110 Wrigley *et.al*., *English Population History*, pp. 99-101.

We can conclude from the above review of the evidence, and the previous discussion of the same-name method, that it is a reliable technique for measuring burial registration reliability in reconstitution samples. It also lends itself to the study of baptism register reliability, although the number of cases is very much smaller because the technique depends on same-name infant and child burials, which necessarily represent only a small proportion of the total number of baptisms. The fragments of evidence so far emerging from same-name studies suggest that the pattern of baptism registration is very similar to that for burials, a conclusion supported by the census/ baptism register research reported in Table 1.1.

In addition to registration problems, the study of fertility is complicated by the technical problems of calculating fertility rates from reconstitution data. Because a woman has to be tracked from birth through to marriage and the date of her fiftieth birthday, only a very small proportion of women can be covered by this type of reconstitution analysis. In the case of the Cambridge Group's research, only about 2.5 per cent of females born were included in the full reconstitution fertility sample,[111] a proportion referred to by Wrigley himself as a "small fraction" of the total.[112] As we will see, there are formidable problems about the representativeness of the "reconstitutionable minority" in the study of nuptiality and mortality, but in the case of fertility, the samples are so small, and the difficulties concerning reliability so great, that it is impossible to reach meaningful conclusions using reconstitution techniques. However, as the Cambridge Group has argued that nuptiality was the key determinant of fertility, and it is a subject that lends itself to study through both reconstitution and other research, this is a topic to which we will now turn.

---

111 Wrigley *et.al*., *English Population History*, pp. 113, 146. I am grateful to Jim Oeppen for providing technical advice on this matter.

112 E.A. Wrigley, 'How reliable is our knowledge of the demographic characteristics of the English population in the early modern period?', *The Historical Journal* ,Vol. 40 (1997), p. 578.

Age At Marriage:The Cambridge Group's Reconstitution Findings

The Cambridge Group's findings on mean age at first marriage of spinsters are summarized in the following table:

Table 3.3: Mean Age Of First Marriage Of Women, Reconstitution Sample, 1610-1837.[113]

Period	*Number of Marriages*	*Mean Age Of Marriage (Years)*
1610-1674	3253	25.9
1675-1724	2849	26.4
1725-1774	3905	25.2
1773-1779	2941	24.5
1780-1837	3620	24.0

This table shows a high average age at marriage in the early period, particularly for the period 1675-1724, gradually falling by 2.4 years until 1780-1837, and resembles the Cambridge Group's earlier findings about age at marriage. These findings underpin their main argument that it was increasing fertility, resulting from a fall in the age at marriage, which was largely responsible for population growth in the eighteenth century.

However, little or no work has been done on the reliability of marriage registration during the parish register period. It has been assumed generally that marriage registration was very much more reliable than birth or death registration, except for the practice of irregular marriage after about 1660. Wrigley *et. al.* conclude that "for several decades after 1660 clandestine marriage was widespread in England", estimating that it formed between 8 and 13 per cent of all marriages.[114] This estimate however is based on indirect evidence and is therefore of unknown reliability. Little is known about the age at which people married clandestinely, but such marriages are likely to have taken place, at least for women, at a younger age than normal on account of their irregularity.

---

[113] I have aggregated some of the periods from the original table so as to make the data more manageable and for purposes of comparison with other evidence. Wrigley *et.al*., *English Population History*, p. 149.

[114] Wrigley *et.al*., *English Population History* pp. 67-69.

As age of marriage is calculated in reconstitution research by tracing individuals from the baptism to the marriage register, one of the key problems is the extent of migration out of the parish of birth. The proportions of baptised children included as adults in the Cambridge Group's marriage samples varied slightly over time, ranging between 20.3 and 25.9 per cent [115], i.e. only between a fifth and a quarter of the total population. It is possible that some of the untraced marriages were due to clandestine or unregistered marriages, but the probability is that most of them were the result of migration out of the parish of birth.[116] Evidence exists to show that migrants had significantly different sociological characteristics from non-migrants. Migrants tended to be labourers or members of other poor socio-economic groups, whereas non-migrants were more likely to be farmers, shopkeepers and property-owners.[117] What effect this had on the age at marriage and how it changed over time, is as yet unknown.

There is a more serious problem for reconstitution research on age at marriage, which raises a very fundamental question about the methods used in its calculation. The problem can best be clarified with reference to an allied problem, the calculation of adult mortality. As we have previously seen, reconstitution rules require that an independent period of observation is established to measure the period at risk of dying during adulthood, and this is necessary because of the problem of migration. Without migration, it would be possible to calculate mean age at death by tracing all people born in a particular parish to their date of death given in the burial register, but migrants moving out of the parish can distort the age structure of the population at risk of dying. For example, if everyone born in the parish moved out at the age of 40 (say), there would be nobody left in the reconstitution sample to die above that age, significantly distorting the calculated real mean age of death. It is largely for this reason that demographers reject this method of calculating mean age at death in reconstitution research.

---

115 I have calculated these proportions from Cambridge Group figures quoted by Ruggles, 'Migration, marriage and mortality', p. 522.

116 See *Ibid* for a general discussion of this issue.

117 Razzell, *Essays in English Population History*, p. 180.

But exactly the same difficulty applies to calculating the average age at marriage: it too is dependent on the age migration patterns of the people born into particular parish, and the greater the amount of migration, the greater the problem. As only between a fifth and a quarter of the people born in the Cambridge Group's reconstitution sample could be traced to a date of marriage, there seems to have been a great deal of outward migration from these parishes. And as with the average age of death, differential age migration can fundamentally distort the calculation of the mean age at marriage. A hypothetical example will illustrate this point most clearly: if in an initial period fifty per cent of all women married under the age of twenty-five, at an average age of 22.5 years, and fifty per cent married above twenty-five, at an average age of 27.5 years, and fifty per cent of both groups emigrated out of the parish, the average age of reconstituted marriage would be 25.0 years. If in a subsequent period the average age at marriage stayed the same in both groups, but none of the women marrying under twenty-five emigrated, and all marrying above the age of twenty five years did so, the reconstituted age at marriage would drop to 22.5 years. The real average age at marriage would stay the same, but migration patterns would create an artificial reduction in reconstitution age at marriage of 2.5 years

Without knowing the age structure of migration, and how it changed over time, it is impossible using reconstitution methodology, to make an objective calculation of the average age at marriage. Ruggles has attempted to create a micro-simulation model of marriage and migration, using known evidence from historical and demographic data, concluding that the Cambridge Group's reconstitution study could understate the average first age of marriage of women by about 2.9 years.[118] This figure depends on a number of different assumptions, some of which have been challenged by Wrigley in a critique of Ruggles's work.[119] But both Ruggles and Wrigley resort to a number of assumptions of unknown reliability, and use samples which form only a fraction

---

118 This figure is for a medium migration pattern. See Ruggles, 'Migration, marriage and mortality', Table 4, p. 512.

119 See E.A. Wrigley, 'The effect of migration on the estimation of marriage age in family reconstitution studies', *Population Studies*, Vol. 48 (1994), pp. 81-97.

of the total population − for example married women who are known to have survived to the age of fifty, forming just 6 per cent of the total reconstitution population.[120]

Wrigley has attempted to evaluate the problem of the impact of migration on marriage ages by citing evidence from the 1851 Census, which shows that there was little difference between the marriage ages of migrants and natives enumerated in the census.[121] This evidence indicates that at the end of the parish register period migration does not appear to have unduly distorted the pattern of marriage ages. But there are general grounds for expecting migrants to marry later than natives, and as Ruggles points out, the later people married, "the greater the odds that they would eventually migrate".[122] There is also evidence for the earlier parish register period that this was the case. In her study of London marriage during the early seventeenth century Vivien Elliott found that native-born women married much earlier than migrant women: 494 native women had a mean age of marriage of 20.5 years, whereas 500 migrant women married at an average age of 24.2 years − a difference of 3.7 years.[123]

Elliott used marriage licences as her chief source, as these give information on the marriage ages of both natives and migrants. I have analysed data from marriage licences for the East Kent area, covering 289 parishes. A sample of 200 migrant spinsters was compared to 200 native spinsters for the period 1619-60, and the mean age at marriage of the first group was 24.1 years and the second group was 22.4 years, a difference of 1.7 years. Amongst the native group 43 per cent of women married under the age of 21, compared to 19 per cent amongst the migrants, a significant difference.[124] These variations support

---

120 Ruggles, 'Migration, marriage and mortality', p. 521.

121 Wrigley, 'The effect of migration', p. 93.

122 Ruggles, 'Migration, marriage and mortality', p. 507.

123 V. B. Elliott, *Mobility and Marriage in Pre-Industrial England* (Cambridge University Ph.D. Thesis, 1978), pp. 291, 325.

124 See J. Meadows Cowper (ed.), *Canterbury Marriage Licences, 1619-1660* (Canterbury 1894). Migrant women were defined as living in a different parish from their parents at the time of marriage, whereas natives were defined as living in the same parish. The first 100 native and migrant cases were selected from the

Ruggles's argument about the distorting effect of migration on the calculation of marriage ages, but the question remains, what was the overall age at marriage of the total population, including both natives and migrants?

A study of marriage licences which includes information on both natives and migrants may help provide an answer. Marriage by licence was more expensive than marriage by banns, but in the seventeenth century it was sufficiently cheap to become very popular in some areas, although its popularity declined as prices increased in the eighteenth century as a result of taxation and other measures.[125] For example, according to a sample of fourteen parish registers in London which listed whether marriages were by banns or licence, two thirds of marriages were by licence in the half-century before 1650, a proportion which had increased to about 90 per cent by the period 1651-1750, before declining to about 30 per cent by the beginning of the nineteenth century.[126]

Marriage by licence was resorted to more frequently in London than elsewhere, but in some other areas it was also very popular. According to local parish registers, about 78 per cent of marriages in Rochester, Kent were by licence in the period 1680-1749, and in East Greenwich, Kent the equivalent figure was 59

---

beginning of the volume, and the last 100 native and migrant cases were selected from the end of the volume, both sets of samples yielding similar results.

125 In some areas the price of marrying by licence increased from about ten shillings at the beginning of the seventeenth century to £1.3.6d in 1742, and £3.3s. by 1834. See J. Gibson, *Bishops Transcripts and Marriage Licences* (Birmingham 1991), p.4; B. Frith (ed.), *Gloucestershire Marriage Allegations, 1637-80* (Bristol 1954), p. xvii; D.J. Steel, *General Sources of Births, Marriages and Deaths Before 1837* (National Index Of Parish Registers, Vol. 1, 1976), p. 225.

126 The fourteen parishes are St.Gabriel Fenchurch Street; St.Nicholas Cole Abbey; St.Michael Bassishaw; St.Mary Woolnoth; St.Vedast; St. Peter Cornhill; St. Mary Aldermary; St. Michael Cornhill; St. Antolin Budge Row; Bridewell Hospital Chapel; St. Margaret Pullens; All Hallows Lombard Street; St. Benet Gracechurch & St. Leonard Eastchurch; and St. Clement Eastcheap. The exact figures for all fourteen parishes (number of total marriages in brackets) are: 1600-49: 65.4% (1745); 1650-99: 91.0% (1750); 1700-49: 87.6% (4673); 1750-99: 53.8% (3166); 1800-37: 30.6% (2401).

per cent.[127] Overall, the figure in the county of Kent was about 40 per cent for most of the seventeenth century and the first half of the eighteenth century,[128] a proportion very similar to that found in Gloucestershire in the seventeenth century, where it is estimated that about a third of all marriages were by licence.[129] Although these figures do not represent a majority and tended to exclude the poorest section of the population, they did cover a very wide socio-economic range, from husbandmen, fishermen, artisans, farmers, to professionals and gentry. Marriage licences also have the important advantage of including both migrants and non-migrants, and forming a significantly higher proportion of population in the pre-1750 period than that included in the Cambridge Group's reconstitution sample − covering between 30 and 90 per cent compared to the average reconstitution figure of about 20 per cent.

Most seventeenth century licences include information on marriage age, and these age statements appear to have been reasonably reliable.[130] The following table gives the mean age at first marriage of women calculated from licenses in different counties:

---

127 The exact figures are: Rochester 1680-1749: 78.0% (1810 marriages); East Greenwich 1680-1729: 58.8% (1140 marriages).

128 I originally calculated the proportion of people marrying by licence through using parish register and marriage licence returns and I estimated that the proportion of marriages by licence in East Kent during 1677-1725 was 50.7%. See Razzell, *Essays in English Population History,* p. 183. Since I calculated that figure, Jane Jones has published a more reliable estimate, based on the enumeration of entries in parish and marriage licence registers. She estimates that the proportion of marriages by licence in East Kent for the period 1661-1690 was 37 per cent, suggesting that the overall figure for the late seventeenth and early eighteenth century was nearer to 40 than 50 per cent. See J. Jones, 'Counting marriages', *Local Population Studies*, No. 53 (1994), pp. 77, 78.

129 Frith, *Gloucestershire Marriage Allegations*, p. xvi.

130 Razzell, *Essays in English Population History*, p. 83.

Table 3.4: Age At First Marriage Of Women Listed In Marriage Licenses, 1660-1714.[131]

Period	*County*	*Number of Marriages*	*Mean Age At Marriage (Years)*
1662-1714	Yorkshire	7242	23.8
1660-1702	London	500	21.9
1661-1700	Kent	1000	24.1
1670-1709	Nottinghamshire	3284	24.4
1690-1709	Suffolk	356	23.6
1682-1685	Wiltshire	300	25.0

The mean average age at marriage of spinsters marrying in these six counties was 23.8 years, significantly lower than the equivalent figure in the reconstitution sample for 1675-1724, 26.1 years. The marriage licence figures indicate that there was some regional variation, with the lowest marriage age figure (London) being about 3 years lower than for the highest figure (Wiltshire). However, most counties had mean marriage ages in the narrow band of 23.6 - 24.4 years, and so the overall average of 23.8 years is a representative figure, at least for this sample of counties.

The mean age of first marriage of women marrying in 1838-40 in England and Wales according to Registrar-General's figures was about 24.7 years.[132] The marriage licence figures suggest that there was a slight long-term rise in average marriage ages of about 0.9 years, contradicting the finding from the reconstitution study of a fall in age of marriage of 2.4 years. The contradiction between the two sets of findings can only be clarified by further research, perhaps combining work on reconstitution data with marriage licence analysis. We can only conclude that the Cambridge Group's argument that there was a significant fall in the average age at marriage in the eighteenth century is at present unsustainable.

131 *Ibid*, p. 184.

132 Wrigley *et.al.*, *English Population History*, p. 156.

The Propensity To Marry.

The propensity of people to marry is a key dimension of nuptiality, which can have a significant influence on the level of fertility. Reconstitution methodology has little to say on this important issue. Some data is available from local censuses which allows the study of long-term changes in proportions marrying, the fullest being that for Lichfield, Staffordshire.

Table 3.5: Age And Marital Status In Lichfield, 1695 And 1851.[133]

Age Group	*Period*			
	1695	*1851*	*1695*	*1851*
	Number In Age Group	*Number In Age Group*	*Proportion Ever Marrying %*	*Proportion Ever Marrying %*
15-19	171	199	0.6	1.0
20-24	147	146	15.0	21.2
25-29	144	147	50.0	53.7
30-34	111	115	77.5	60.9
35-39	138	101	84.1	77.2
40-44	62	113	95.2	77.9
45+	274	432	98.2	81.5

The comparison of these two censuses for Lichfield suggests that there was a long-term increase in the proportion of women never marrying. At the end of the seventeenth century 98.2 per cent of all women over the age of 45 were either married or widowed; by 1851 this proportion had fallen to 81.5%. Other late-seventeenth century censuses indicate how popular marriage was at that time: for example, none of the 69 women over the age of 45 living in

133 The figures for 1695 are from a complete enumeration of Lichfield in that year, whereas the 1851 data is derived from a 1 in 2 sample. See Razzell, *Essays in English Population History*, p. 218.

Chilvers Coton in 1684 were spinsters.[134] However, as might be expected, there were local variations, and 15 of the 161 (9.2%) women over the age of 45 living in Stoke-On-Trent in 1701 had never been married.[135]

There is some evidence that the propensity for widows to remarry diminished significantly during the eighteenth century. Samples were taken from the marriage licences for East Kent (covering 289 parishes) to examine whether widowed mothers had remarried between the death of their husbands and the marriage of their daughters.

Table 3.6: Proportion Of Widowed Mothers Remarrying In East Kent.[136]

Period	*Number*	*Proportions Remarrying %*
1619-1646	100	49
1661-1676	72	51
1751-1780	100	10
1751-1810	100	9

There was a major drop in the proportion of widows remarrying between the seventeenth and later eighteenth century. This echoed a similar fall in the number of widows as a percentage of all marriages that took place in East Kent during the same period: from about 30 % in the seventeenth century to just over 10 % in the late eighteenth.[137] Similar reductions have been found elsewhere,[138] and whether these changes were the result of falling mortality or a reduction in the propensity to remarry (or a combination of both), there were clearly some very radical changes in the structure of marriage taking place in the eighteenth century.

---

134 Razzell, *Essays in English Population History* p. 219.

135 *Ibid.*

136 *Ibid,* p. 217.

137 *Ibid.*

138 *Ibid*, p. 216.

Given the uncertainties about calculating the average age and propensity to marry, it is not possible to come to any firm conclusions about the role of nuptiality in shaping fertility in early modern England. The Cambridge Group's data is too uneven to be reliable, and is contradicted by independent evidence such as that derived from marriage licences and local censuses. Further evidence − particularly that which combines data from censuses, marriage licences and parish registers − and future research should help clarify some of these issues.[139]

Infant And Child Mortality

One area of the Cambridge Group's work which is subject to less difficulty is the study of infant and child mortality. This is because the number of families migrating in the period immediately after the birth of children was relatively small. Also, it is easier to measure independent events establishing the period at risk for this than any other group in reconstitution studies. However, as we shall see, there are a number of problems in calculating accurate infant and child mortality rates.

Infant mortality represents the proportion of children born and dying in the first year of life, and is calculated by linking births and infant deaths in families known to have resided in the parish for this first year. To measure infant mortality accurately, it is important to establish a correct link between a child in the baptism and burial registers, mainly through information on names of parents and the age of the child at death.

One of the major problems in calculating infant mortality rates is the delay between birth and baptism which occurred in many English parishes. The Anglican Church did not consider an unbaptised child a formal member of the church, and in many instances clergymen refused to register the burial of children dying before baptism. As infant mortality was very high in the first few weeks of life, this could be a source of considerable under-registration of infant deaths. There is evidence that the period between birth and baptism lengthened in the eighteenth century, and Wrigley *et. al*. conclude that the "average

139 See Table 5.3, p. 130 for additional data on nuptiality patterns.

gap between birth and baptism grew slowly longer ... and by the later eighteenth century was perhaps a month long on average and much longer in many individual cases."[140]

There is no systematic evidence for the birth-baptism interval for the Cambridge Group's reconstitution sample, but other evidence does confirm the conclusion that the interval lengthened generally in the late eighteenth and early nineteenth centuries. Information in some of the registers included in the 45 parish census/ baptism comparison research, indicates that the median delay between birth and baptism rose from about 3.5 weeks in 1761-80 to 6 weeks in 1831-55.[141] Using these latter birth-baptism delay figures and civil registration returns for 1839-44, yields an infant mortality rate before baptism of 54.5 per 1000.[142] This is over a third of all infant mortality in this period, a very significant proportion, although some of this is likely to have been reduced by the practice of giving emergency baptism to vulnerable children.

It is against this background that we can discuss the infant mortality findings in the twenty-six-parish reconstitution sample. The Cambridge Group's figures show that infant mortality rose from 165 per 1000 at the beginning of the seventeenth century to 190 per 1000 in the first half of the eighteenth century, before falling to 140 per 1000 by the early nineteenth century. Virtually all this fall occurred amongst young infants: mortality in children aged 29 days fell from 102 per 1000 in 1725-49 to 49 per 1000 in 1825-37.[143]

Wrigley *et.al* themselves point out one major problem with this data: "The pattern of change during the eighteenth century ... is suspiciously like that which would have arisen from a progressive weakening in the coverage of deaths taking place early in life before baptism had occurred."[144] Wrigley and colleagues dismiss this worry through comparing their data with that from the Registrar-General, showing similar patterns of endogenous and

---

140 Wrigley *et.al*., *English Population History*, p. 229.

141 Razzell, *Essays in English Population History*, pp. 104, 105.

142 *Ibid*, p. 147.

143 Wrigley *et.al*., *English Population History*, p. 226.

144 *Ibid*, p. 230.

exogenous infant mortality.[145] But only eight parishes are included in this comparison, and there is no direct information on birth-baptism intervals in the reconstitution sample for the eighteenth century period. It is therefore not possible to say whether the Cambridge Group's finding of a sharp fall in neo-natal mortality is reliable. The overall evidence is that the average birth-baptism delay increased from about 8 days in the 1670s to about 54 days in the 1810s.[146]

Wrigley *et.al.*'s data on child mortality suggests a slightly different pattern of mortality: After a modest increase in the seventeenth century there was a decrease from the middle of the eighteenth century onwards. The mortality rate for children between 1-9 years of age rose from 130.8 per 1000 in 1580-1599 to 171.1 per 1000 in 1725-1749, before falling to 133.0 per 1000 by 1825-1837.[147] This type of data is the most reliable of any published by the Cambridge Group, as it is not significantly subject to the difficulty of birth-baptism delay or the problem of migration.

However, all the above conclusions are based on the parishes not excluded on grounds of unreliability, in particular the eight parishes for the period 1790-1837. If we put back the excluded parishes, a modified pattern of infant and child mortality emerges. I have recalculated infant and child mortality rates by including the Cambridge Group's unpublished data which was excluded from the reconstitution sample, and the evidence for nineteen parishes with data for the whole period, 1650-1837, is summarized in Table 3.7. [148]

---

145 Wrigley *et.al*., *English Population History*, pp. 231-233.

146 J. Komlos, 'The birth-baptism interval and the estimate of English population in the eighteenth century', *Research in Economic History*, Vol. 11 (1988), p. 308.

147 Wrigley *et.al*., *English Population History*, p. 262.

148 This table is based on data kindly provided by Jim Oeppen. The parishes covered by the table are: Terling, Southill, Shepshed, Odiham, Morchard Bishop, Hartland, Great Oakley, Gedling, Earsdon, Dawlish, Colyton, Bridford, Bottesford, Banbury, Austrey, Ash, Aldenham, Alcester, and Ipplepen.

Table 3.7: Infant And Child Mortality Rates (Per 1000) In Nineteen Cambridge Group Reconstitution Parishes, 1650-1837.

Period	*Infant Mortality*	*Child Mortality (Age 1-9 Years)*
1650-1699	137	128
1700-1749	150	133
1750-1799	119	109
1800-1837	94	90

The scale of fall in the late eighteenth and early nineteenth centuries was greater in the full group of nineteen parishes than in the restricted sample. Table 3.7 indicates a fall in infant and child mortality between 1700-1749 and 1800-1837 of 37 per cent and 32 per cent respectively, compared with falls in the Cambridge Group's published figures of 26 per cent and 22 per cent.

The figures for the full nineteen-parish sample also show that the overall level of infant and child mortality was lower than that indicated by the published figures. However, if inflation ratios derived from same-name research on nine reconstitution parishes discussed earlier[149] are applied to the data in Table 3.7, corrected infant and child mortality rates are as follows:

Table 3.8: Estimated Infant And Child Mortality rates (Per 1000) In Nineteen Reconstitution Parishes, 1650-1837.

Period	*Infant Mortality*	*Child Mortality (Age 1-9)*
1650-1699	188	176
1700-1749	193	171
1750-1799	163	149
1800-1837	122	117

The corrections made in Table 3.8 elevate the levels of mortality but the scale of the falls in infant and child mortality is very similar to the uncorrected figures in Table 3.7. It is the inclusion of the parishes excluded by the Cambridge Group which is important for both Tables 3.7 and 3.8, significantly increasing the

149 See Table 1.5, p. 15.

level of fall in mortality in both tables. The corrected infant mortality rates do not allow for any changes in birth-baptism delays, which would probably increase infant mortality to over 200 per 1000 in the period 1650-1749 and about 150 per 1000 by the beginning of the nineteenth century. Also, these figures do not include illegitimate children who probably constituted over 5 per cent of all births during the late eighteenth century and had an infant mortality rate at least twice as high as legitimate children.[150]

However, there are reasons to believe that the fall in infant and child mortality was even greater that that depicted in Table 3.8. Wrigley and colleagues discuss at some length the correlation between population density and levels of overall mortality. They cite Farr's work on the association between population density and levels of mortality for the nineteenth century and argue that a similar correlation probably applied equally to England in the seventeenth and the eighteenth centuries.[151] But in the period up to 1750, infant and child mortality were actually higher in the smaller parishes in the reconstitution sample than in the larger ones. In the group of 19 parishes with continuous data for the period 1650-1837, there are five parishes with populations lower than 1,000 in 1801, with an average population size of 643. These can be compared to fourteen parishes with populations over 1,000 at the same date (average population size 1,767). The infant and child mortality rates of the two groups of parishes are as illustrated in Table 3.9.[152]

---

150 Wrigley *et.al.*, *English Population History*, pp. 219-223.

151 *Ibid,* p. 202.

152 These figures are calculated from data provided by Jim Oeppen. I have taken the averages of the mortality rates for the parishes in the two categories. The five small rural parishes are Austrey, Bottesford, Bridford, Great Oakley and Terling. The fourteen larger parishes are those listed in footnote 148, minus these five parishes.

Table 3.9: Infant And Child (Age 1-9 Years) Mortality Rates (Per 1000) In 6 Small Rural Parishes Compared With 20 Large Parishes, Cambridge Group's Reconstitution Sample, 1650-1837.

Period	*Five Small Rural Parishes*		*Fourteen Larger Parishes*	
	Infant Mortality	Child Mortality	Infant Mortality	Child Mortality
1650-1699	153	137	131	124
1700-1749	170	137	143	131
1750-1799	140	94	112	114
1800-1837	85	79	97	96

Infant mortality was higher in the five small rural parishes than in the larger parishes up to the end of the eighteenth century, but this relationship was reversed during the early nineteenth century: the classic pattern of a correlation between population size and high mortality had been established. For child mortality the change took place in the second half of the eighteenth century.

Some of the differences discussed above may be the result of different levels of burial under-registration in different size parishes. Previously we saw how smaller parishes tended to have more reliable registration systems, and so it is possible that some of the higher mortality in the smaller parishes is a function of better registration reliability. There is no direct evidence available on population size and same-name ratios, and so it is not possible, at this stage, to evaluate this hypothesis.

If we inflate infant mortality by the overall burial under-registration ratio revealed in the same-name research discussed earlier, the corrected infant mortality rate for the small rural parishes is about 200 per 1000 for the period 1650-1749. This does not allow for unrecorded deaths before baptism, which would probably inflate the infant mortality rate to significantly above 200 per 1000.

There is other evidence that some eighteenth century rural parishes had very high mortality rates. The Nottinghamshire village of Clayworth, made famous by Peter Laslett and John Harrison in their study "Clayworth and Cogenhoe",[153] had a population of just over 400 people in the 1676-1688 period when two special censuses where carried out by the local incumbent. The infant mortality rate in the twelve years between the censuses was 322 per 1000 (46 infant deaths out of 143 births),[154] and this does not allow for any possible under-registration of burials.

I have carried out a reconstitution study of two small rural Bedfordshire parishes in the eighteenth and nineteenth centuries.[155] Infants were tracked from their date of baptism, and if they survived, through to the end of their fifth year. An independent event – such as the baptism of a sibling or the burial of a parent – was used to establish the presence of the family in the parish for the five-year period. Same-name inflation ratios were calculated by using the procedures described previously. The detailed results of this analysis are as follows:

---

153 P. Laslett and J. Harrison, 'Clayworth and Cogenhoe', H.E. Bell and R.L. Ollard (eds.), *Historical Essays 1600-1750 Presented to David Ogg* (London 1963).

154 I have calculated these figures from the parish register deposited in the Nottinghamshire Record Office.

155 I am grateful to Peter Francois and Pat Carroll for undertaking the reconstitution work on these parishes. These two parishes were selected because both parents' names are listed in the baptism registers for the whole period covered, enabling an accurate listing of all children baptized to particular parents. The burial of an infant was established either through the designation of 'son' or 'daughter' of one or both of the parents in question, or through the designation of 'infant', with or without an age being given in the burial register.

Table 3.10: Infant And Child (Age 0-4 Years) Mortality Rates (Per 1000) For The Parishes Of Poddington And Elstow, Bedfordshire, 1700-1899.

Period	*1700-1749*	*1750-1799*	*1800-1849*	*1850-1899*
Number of Baptisms	767	910	1183	701
Number of Infant Burials	135	188	121	51
Uncorrected Mortality Rate	176	207	105	73
Same-Name Ratio	67/55	98/79	54/40	13/11
Corrected Infant Mortality Rate	214	256	138	86
Number Of Children At Risk	550	623	965	498
Number of Child Burials	40	62	58	21
Uncorrected Mortality Rate	73	100	60	42
Same-Name Ratio	67/55	98/79	54/40	13/11
Corrected Child Mortality Rate	94	123	81	50

The estimated mortality rates corrected by the same-name ratios are summarized in Table 3.11:

Table 3.11: Estimated Infant And Child (0-4) Mortality Rates (Per 1000) In Poddington And Elstow, Bedfordshire, 1700-1899.

Period	*Infant Mortality Rate*	*Child Mortality Rate*
1700-1749	214	94
1750-1799	256	123
1800-1849	138	81
1850-1899	86	50

The infant and child mortality rates increased in these two Bedfordshire parishes in the eighteenth century, before falling sharply in the nineteenth century.

Taken in conjunction with the findings on small rural parishes in the Cambridge Group's reconstitution sample, this evidence indicates that infant and child mortality was high in some villages and hamlets. As infant mortality in late nineteenth century rural areas was of the order of 100 per 1000,[156] it would appear that there was a strong reduction in infant mortality between the end of the eighteenth century and the end of the nineteenth − perhaps of the order of 200 per 1000 to 100 per 1000. Most of this decrease probably took place in the first half of the nineteenth century, a neglected period of English demographic history.[157]

Although the smaller parishes in the Cambridge Group's sample appear to have had higher infant and child mortality rates than the larger ones, there is some evidence that larger town parishes had even higher mortality rates during the late seventeenth and early eighteenth centuries. I have carried out reconstitution studies on the market town of Ampthill in Bedfordshire, the parish of St. James's in Norwich, St. Aphage's in Canterbury, St. Peter's and St. Nicholas's in Ipswich, and the parish of St. Swithin's in the City of London.[158]

---

156 This conclusion is derived from Registrar-General's figures, as well as research carried out at the Open University on infant mortality, based on copies of civil birth and infant death registers compiled for purposes of compulsory vaccination. See M. Drake and P.E. Razzell, *The Decline of Infant Mortality in England and Wales 1871-1948: a Medical Conundrum* (Interim report submitted to the Wellcome Trust).

157 There is some independent evidence of a significant fall in mortality in the period 1801-40. See Razzell, *Essays in English Population History*, pp. 114-116.

158 All data is based on transcripts of registers lodged in the Society of Genealogists' library. Only registers including information on both parents names in the baptism register were selected, and the nominal record linkage rules are the same as those used in Table 3.10. All subsequent reconstitution tables of infant and child mortality are based on the same procedures. For Ampthill a sample of baptisms and burials was used, selecting all cases beginning with the letters A-G. For all other parishes, 300 baptisms meeting appropriate nominal record linkage criteria were selected. The same-name correction ratios are: Ampthill: 42/37; St. James's Norwich: 40/36; St. Aphage's Canterbury: 32/24; St. Peter's & St. Nicholas's Ipswich: 22/14; St. Swithin's London: 26/21.

Table 3.12: Estimated Infant And Child(1-4) Mortality (Per 1000) In Ampthill, Norwich, Canterbury, Ipswich, And London In The Late Seventeenth And Early Eighteenth Centuries.

Place	*Period*	*Number Of Baptisms*	*Number Of Children At Risk*	*Estimated Infant Mortality Rate*	*Estimated Child Mortality Rate*
Ampthill	1700-1749	505	364	191	128
St. James's, Norwich	1681-1705	300	188	300	272
St. Aphage's, Canterbury	1681-1705	300	174	307	204
St. Peter's and St. Nicholas's, Ipswich	1660-1709	300	151	267	220
St. Swithin's, London	1675-1699	300	159	363	273

The birth-baptism interval was very short in these towns at this period, ranging from a mean of three to thirteen days,[159] minimizing the under-registration of infants dying before baptism.

The infant mortality rates ranged from 191 per 1000 in Ampthill to 363 per 1000 in St. Swithin's London.[160] Although the infant mortality rate in London was very high, it was nearly matched by the rates for Norwich and Canterbury – 300 per 1000

[159] Information is provided in the baptism registers on birth-baptism intervals for some of the periods covered by Table 3.12. A sample of years was selected and the average interval between birth and baptism was as follows (number of cases in brackets): Ampthill, 1700-09: 9 days (40); St. James's, Norwich, 1696-1700: 3 days (250); St. Peter's, Ipswich, 1686-87: 13 days (100 cases); St. Swithin's, London, 1677-99: 8 days (300). These short birth-baptism intervals may have been partly the result of high infant mortality rates, with parents anxious to prevent the death of their children before baptism.

[160] For confirmation of this high level of infant mortality in London during this period see J. Landers, *Death and the Metropolis: Studies in the Demographic History of London 1670-1830* (Cambridge 1993); P. E. Razzell and C. Spence, 'The history of infant, child and adult mortality in London, 1550-1850', *The London Journal* (2007, Forthcoming).

and 307 per 1000. In these three towns, between a half and two-thirds of all children died before the age of five, and these are minimum figures because of unregistered mortality before baptism and the exclusion of illegitimate children. Infant mortality in towns of this size had fallen by the mid-nineteenth century to between 155 and 195 per 1000,[161] indicating a long-term shift in mortality, perhaps falling by one half in the 150-year period.

The History Of Adult Mortality

The Cambridge Group's new reconstitution findings have led them to revise their conclusions about changes in adult mortality in the eighteenth century. Whereas they previously found a modest increase in adult expectation of life, they now believe that reductions in adult mortality were significantly greater than they previously thought.[162] Their new findings can be summarised as follows:

"The overall pattern of change ... was of deteriorating mortality during the seventeenth century with a pronounced low point during the 1680s, followed by a marked rise during the first half of the eighteenth century, which had, however, largely levelled off in the second half of the century. From its lowest point in the 1680s to the high point in 1750-9, the rise in e25 [expectation of life at age 25] was almost 9 years, from 27.8 years to 36.6 years, though if the comparison is made between the mid-seventeenth century and the 1750s, the rise is much more modest, since e25 in 1640-59 was 31.4 years, a level only 3 or 4 years short of some decadal figures recorded in the later eighteenth century."[163]

Wrigley and his colleagues cite findings from other work in support of their conclusions about adult mortality. Adult expectation of life amongst tontine nominees, the aristocracy, Scottish advocates, fathers in marriage licences and Members of

161 See N. Williams and C. Galley, 'Urban-rural differentials in infant mortality in Victorian England', *Population Studies*, Vol. 49 (1995), p. 411.

162 Wrigley *et.al.*, *English Population History*, pp. 283-284.

163 *Ibid*, p. 282.

Parliament, increased by a minimum of 9 years in the seventeenth and eighteenth centuries, similar to the Cambridge Group's figure quoted above.[164] But there are also significant points of divergence: most of the data for other groups showed little or no change in adult expectation of life during the seventeenth century, and the long-term increase in e25 was 11 to 12 years, rather than the 3 or 4 years found by Wrigley and his colleagues.[165] The other major difference in findings is that amongst some of the groups there was a continuing increase in life expectancy throughout the second half of the eighteenth century, including the aristocracy and Members of Parliament, and the data for the latter two groups is perhaps the most reliable of any information available.

The Cambridge Group acknowledge that their figures on adult mortality are not their strongest material, accepting in the new volume that "the mortality of adults who married ... cannot normally be established with as much precision as that of infants and children, and the mortality of adults who never married cannot be established at all."[166] The lack of precision results largely from a problem touched on previously: adults can be observed to the occurrence of an independent event, such as the burial of their spouses or their children, but are lost from observation if such independent information is not available. This creates uncertainty about what happens to them during this lost period of observation, and although a great deal of sophisticated statistical work has been undertaken to measure this uncertainty, the matter remains a matter of controversy.[167]

There are other major problems with adult mortality data from reconstitution studies. As the samples are selected from individuals traced from the baptism to the marriage register (to establish the age at which an adult enters observation), only between a fifth and a quarter are included in the Cambridge Group's initial reconstitution sample on adult mortality. This proportion further diminishes as a result of people being lost from observation, and the final group on which calculations of adult

---

164 Razzell, *Essays in English Population History*, p. 201.

165 *Ibid*.

166 Wrigley *et.al.*, *English Population History*, p. 11.

167 *Ibid*, pp. 581-600.

mortality are based, includes only between 8.6% and 10.2% of the total sample.[168] Such small minorities are unlikely to be representative, either sociologically or demographically.

An even greater difficulty is the unknown pattern of burial registration reliability in the Cambridge Group's sample. There are so many problems with the reconstitution calculations of adult mortality that it necessary to look elsewhere for meaningful data.

A number of other sources of information about adult mortality exist. The material on the adult life expectancy of groups such as tontine members, the aristocracy, Members of Parliament, and Scottish advocates, has already been referred to and has been published in detail elsewhere.[169] All this material relates to relatively privileged groups but the evidence from marriage licences covers a much wider socio-economic range, including labourers, husbandmen, fishermen, artisans, farmers, merchants, professional and gentry groups. The Cambridge Group found that there was an increase in adult mortality in the seventeenth century, but evidence from the East Kent marriage licences shows that there was a slight improvement in adult life expectancy which accelerated significantly in the eighteenth century amongst all socio-economic groups.[170]

The timing of the eighteenth century improvement in Kent cannot be precisely measured because of gaps in the source material, but marriage licences issued by the Vicar-General have survived almost in their entirety and allow a precise analysis of changing mortality. The Vicar-General had jurisdiction over all parts of England & Wales, but in practice the majority of marriages covered were for London and the Home Counties. We have already seen that there is evidence that two-thirds of Londoners used marriage licences in the seventeenth century, a proportion which rose to about 90 per cent by the period 1650-1749. Information in the Vicar-General's licences is detailed and of high quality, because spinsters marrying under the age of 21

---

168 These figures are calculated from data cited in Ruggles, 'Migration, marriage and mortality', p. 522.

169 Razzell, *Essays in English Population History*, pp. 192-201.

170 *Ibid,* pp. 196, 197.

were required to have a sworn affidavit from their parents or guardians confirming consent. The following is an analysis of the proportion of fathers dead and how it changed over time.[171]

Table 3.13: Paternal Mortality Amongst Fathers Of Brides Marrying Under 21, Vicar-General's Marriage Licences, 1600-1849.

Period	*Number of Fathers In Sample*	*Number of Fathers Dead*	*Proportion Of Fathers Dead %*
1600-1641	500	303	43.4
1661-1699	1950	901	46.2
1700-1749	2500	1171	46.8
1750-1799	1937	694	35.8
1840-1849	500	43	28.6

There is no data on the ages of fathers, although this is not likely to have changed greatly during the period covered by Table 3.13,[172] and there is no precise information on the geographical origins of fathers. However, the overall trend over time is clear. After a slight rise at the beginning of the seventeenth century, there was a long period of stability lasting until about the middle of the eighteenth century. The proportion of fathers who had died fell steadily throughout the latter half of the eighteenth century and beginning of the nineteenth century. As most dead fathers had died on average about 10 years previous to the marriage of their daughters, the fall in mortality occurred from about 1740 onwards.

Although the Vicar-General's and East Kent figures are not strictly comparable because of various time gaps in the data,

171 The material for the period 1600-41 is taken from G. J. Armytage, *Allegations for Marriage Licences Issued by the Bishop of London, 1520-1610* (Harlaian Society, Vol. 25, London 1887). The data for 1661-1849 is derived from copies of the Vicar-General's Marriage Allegations lodged in the Society of Genealogists library. The first 500 cases were selected for each decade covered by the table, except for 1661-1669 and 1780-1789 when only 450 and 437 cases were available.

172 See Razzell and Spence, 'The history of infant, child and adult mortality in London', for a more detailed discussion of this issue.

the evidence suggests that paternal mortality fell at an earlier date and more rapidly in the latter than the former.

Table 3.14: Paternal Mortality Amongst Fathers Of Brides Marrying Under 21, East Kent And Vicar-General's Marriage Licences, 1600-1849.[173]

East Kent Licences			*Vicar-General's Licences*		
Period	*Total Number Of Cases*	*Proportion Of Fathers Dead %*	*Period*	*Total Number Of Cases*	*Proportion Of Fathers Dead %*
1619-1646	1275	46.7	1600-1641	500	43.4
1661-1700	848	43.2	1661-1699	901	46.2
1751-1779	1799	25.7	1750-1779	1500	37.1
1780-1809	1233	23.1	1780-89 & 1840-49	937	29.9

Most of the 289 areas covered by the East Kent licences were small rural parishes, whereas the Vicar-General's licences mainly covered London and its immediate environs. Table 3.14 indicates that the reduction in adult mortality first took place in rural and not urban areas. This is a conclusion confirmed by Quaker data on adult expectation of life.[174]

[173] For the source of the data in this table see Razzell, *Essays in English Population History*, p. 196, and Table 3.13 above.

[174] The following figures are based on life expectancy of male and female married Quakers with information on age at death. See R.T. Vann and D.E.C. Eversley, *Friends in Life and Death* (Cambridge 1992), p. 229. Vann and Eversley made no attempt to correct these figures for burial under-registration.

Table 3.15: Life Expectancy (Years) Amongst Adult Quakers, 1650-1849.

Cohort	*Age 25-29*			*Age 30-34*		
	Urban	Southern England	Northern England	Urban	Southern England	Northern England
1650-1699	28	27	29	27	26	26
1700-1749	27	32	35	25	30	32
1750-1799	32	36	31	30	33	30
1800-1849	30	34	*	30	34	32

Quaker life expectancy increased during the first half of the eighteenth century in both southern and northern areas, whereas it only grew in urban areas after the middle of the eighteenth century.

Adult mortality also fell in Nottinghamshire during the eighteenth century, and it occurred mainly in the first half of the century. Table 3.16 summarises estimates of paternal mortality at three periods between 1661 and 1793.[175]

[175] For the source of data see T.M. Blagg and F.A. Wadsworth (eds.), 'Abstracts of Nottinghamshire marriage licences 1577-1700', *British Record Society Index Library*, Vol. 58 (London 1930); T.M. Blagg and F.A. Wadsworth (eds.), 'Abstracts of Nottinghamshire marriage licences 1701-53',.*British Record Society Index Library*, Vol. 60 (London 1935); T.M. Blagg (ed.), 'Abstracts of the bonds and allegations for Nottinghamshire marriage licences', *Thoroton Society Record Series*, Vol. 10 (Nottingham 1946-47); L.M. Shaw (ed.), *Nottinghamshire Marriage Bonds, 1791-1800* (Nottingham 1987). The average age of marriage of all spinsters in the 1660s was about 25 years, whereas spinsters marrying under twenty-one married on average at about 19 years. Dividing the proportion of dead fathers by these mean ages of marriages gives the estimated mortality rates.

Table 3.16: Paternal Mortality Amongst Fathers Of Brides Marrying In Nottinghamshire, 1661-1793.

Period	*Nature Of Sample*	*Number Of Total Cases*	*Number Of Dead Fathers*	*Proportion Of Dead Fathers %*	*Estimated Annual Mortality Rate Per 1000*
1661-63	All Spinster Brides	174	95	55	22
1754-58	Spinsters & Grooms Marrying Under 21	200	53	27	14
1791-93	Spinsters & Grooms Marrying Under 21	200	38	19	10

Mortality fell by more than a half between 1661-63 and 1791-93, echoing similar reductions in adult mortality found in East Kent. Two-thirds of the fall in mortality in Nottinghamshire took place between 1661 and 1754-58, and the remaining third occurred between 1754-58 and 1791-93. In the later eighteenth century, there was a similar reduction in the proportion of dead fathers in Sussex − from 22 per cent in 1754-74 to 16 per cent in 1775-1800.[176]

The decline in adult mortality is confirmed by John Landers' study of mortality in London for the eighteenth century. He estimated from the Bills of Mortality and Registrar-General's data, that mortality in London for the 30-44 age group nearly halved between 1730-49 and 1841.[177] There is further evidence from the apprenticeship records of the Stationers' Company. The proportions of apprentices' fathers listed as dead in the eighteenth century were as follows (sample numbers in brackets): 1721-40: 37.8% (1151); 1741-60: 35.5% (1202); 1761-80: 30.9% (1506);

176 See D. Macleod, (ed.), 'Sussex marriage licences for the Archdeaconary of Chichester, 1731-74', *Sussex Record Society*, Vol. 32 (1926); D. Macleod, (ed.), 'Sussex marriage licences for the Archdeaconary of Chichester, 1775-1800', *Sussex Record Society*, Vol. 35 (1929). These figures are based on a total of 225 fathers of spinster brides marrying under 21 in 1754-74 and 405 in 1775-1800.

177 Landers, *Death and the Metropolis,* p. 172.

1781-1800: 24.7% (1897); 1801-20: 23.1% (2957); 1821-30: 21.7% (1490).[178] The majority of these fathers probably lived in London and its environs, similar, perhaps, to the geographical origins of the fathers of young women marrying by Vicar-General's licence.

The proportion of dead fathers listed in these apprenticeship records is lower than that in marriage licence registers, as most apprentices were indentured at about the age of 15, compared to the average age of spinsters marrying under the age of 21, which was approximately 19 years. The decline in mortality indicated by the figures is however very similar to that found for fathers in the Vicar-General's licences: most of the fall occurred between 1750 and 1800, continuing into the early nineteenth century.

The improving adult expectation of life was not confined to the South of England. Civil marriage registers for the north of England in the 1650s gave information on parents, including whether fathers were alive or dead, and the mortality rates of fathers were very similar to those found in Kent, London and the Home Counties in this period.[179] The decline in mortality in the eighteenth century can be tracked for apprentices becoming freemen of the Merchant Adventurers Company in Newcastle-On-Tyne. The mean number of years lived after admission was as follows:

---

178 I am grateful to Michael Turner of the Publishing Project at the Bodelian Library for supplying me with this data on stationers' apprentices.

179 Of 380 spinsters married in Lancashire, Yorkshire and other parts of the north of England during 1654-1660, 226 of them had fathers who were dead at the time of marriage, i.e. 59.5 per cent. See the *St. Mary Manchester Marriage Register* in the Society of Genealogists' library.

Table 3.17: Number Of Years Lived After Admission To The Merchant Adventurers' Company, Newcastle-On-Tyne, 1660-1779.[180]

Period Of Admission	*Number In Sample*	*Mean Number of Years Lived*
1660-79	188	21.1
1680-99	166	20.8
1700-19	143	20.8
1720-39	126	25.4
1740-59	104	25.4
1760-79	77	30.3

Most men appeared to have entered the company at about the age of 22, and expectation of life increased by about 9.5 years, mostly from 1720 onwards.

The increase in expectation of life represented by the mortality figures in the marriage licences and apprenticeship records is about 11 years, and according to the marriage licences this was a long-term change. The Vicar-General's marriage licences indicate a slight worsening of mortality in the seventeenth century, partially supporting Wrigley *et.al.*'s argument about this period, although this may be a function of sample size, and is not supported by data from the East Kent licences and that for the various privileged groups.[181]

After the middle of the seventeenth century, the Vicar-General's data indicates a period of stability lasting until about the late 1730s, followed by a sustained increase in life expectancy up to the late eighteenth century and beyond, similar to the findings from the data sources discussed above. All this material indicates that adult mortality nearly halved between the end of the seventeenth and eighteenth centuries, yielding a long-term increase in adult life expectancy of over ten years, a reduction in

[180] The quality of the information appears to be high, giving full information on dates of admission and death for between 61% and 80% of cases. See F.W. Dendy (ed.), *Extracts from the Records of the Merchant Adventurers of Newcastle-Upon-Tyne* (Surtees Society, Vol. 101, 1899).

[181] Razzell, *Essays in English Population History*, p. 201.

mortality much more substantial than that found by the Cambridge Group.

Conclusion

The Cambridge Group's latest publication − the book under review − contains perhaps their best material to date, focusing on nominal record linkage information which is less subject to ambiguity and uncertainty than the abstract data used in their previous work. Their main achievement has been to create a body of data – both at the aggregative and reconstitution level – which has been collected with meticulous scholarship, providing the raw material for a demographic analysis of England's history for the early modern period.

There is, however, a formidable range of methodological problems with the reconstitution technique, and alternative evidence from other sources raises doubts about virtually all the conclusions reached by Wrigley and colleagues.

In their *Population History of England*, Wrigley and Schofield concluded that "the view that mortality played the dominant role in determining changes in population growth rates … must be set aside so far as English demographic history in early modern times is concerned."[182] Since they wrote that passage in 1981, they have somewhat revised their view, now arguing that a decline in adult mortality played a greater role in population growth than they originally thought. This revised conclusion is partly based on the realization that there were differences in the way infant/child mortality and adult mortality changed over time. The assumption that these different forms of mortality were linked was a result of analysing demographic data in terms of Model Life tables, which assume a constant relationship between mortality levels of different age groups. Wrigley and colleagues originally used these Model Life Tables in their work, but have now rightly cautioned against their use in historical research.[183] However, they themselves have continued to rely on model-building, and it is presumably for this reason that they have not attempted to directly

182 Wrigley and Schofield, *The Population History*, p. 484, fn 60.

183 Wrigley *et.al.*, *English Population History*, pp. 535-536.

measure parish register deficiencies by using censuses, wills, poor law records, and other nominal record linkage data.

The evidence considered in this essay suggests little or no change in nuptiality and fertility in the eighteenth century, but a significant decrease in all forms of mortality in the eighteenth century. The data on adult mortality indicates that it fell by nearly a half between the beginning and end of the eighteenth century. This evidence comes from many sources and covers a variety of socio-economic groups: the aristocracy, Members of Parliament, tontine subscribers, fathers listed in marriage licences, fathers of apprentices, Newcastle merchants, and Scottish lawyers.[184] Although much of this material is for privileged groups, the marriage licence and apprenticeship data covers many different occupational groups from a number of areas of the country.

In addition to the fall in adult mortality, there is evidence that there was a major reduction in infant and child mortality amongst elite socio-economic groups and in some areas from the middle of the eighteenth century onwards. The precise scale and timing of this fall has yet to be established, but reconstitution methodology particularly lends itself to this type of work, especially when allied to same-name research. The explanation of the decline of mortality represents a special challenge to medical historians, whose expertise and knowledge should help resolve this problem. The increase in population which resulted from the fall in mortality also played a key role in the industrial revolution, and clarifying the factors associated with this transformation of English society still remains one of the key intellectual issues of economic, medical and social history.

184 Razzell, *Essays in English Population History*, p. 201.

4. POVERTY OR DISEASE ENVIRONMENT − THE HISTORY OF MORTALITY IN BRITAIN, 1500-1950. [185]

Introduction

In 1955, McKeown and Brown published a seminal paper on the mortality decline in England during the eighteenth century.[186] McKeown went on to develop a general thesis emphasizing the role of the standard of living and improving nutrition as an explanation for the reduction of mortality during the period of the "modern rise of population".[187] This emphasis on economic factors reflected a long tradition of thought, initiated by Adam Smith and Robert Malthus, which assumed that poverty played a central historical role in shaping levels of mortality.[188]

McKeown recognised the complexity of the problem, but argued that, in the absence of effective medical treatments before the twentieth century, changes in living conditions must have played the primary role in the reduction of mortality.[189] Although he implicitly made a distinction between improvements in disease environment and economic living standards, the main emphasis in his work was on economic factors and nutritional levels in explaining changes in mortality.[190] However, much recent demographic work has emphasised the importance of "place" as against poverty and "class" in shaping mortality patterns,[191] and

---

185 This essay was written jointly with Christine Spence and originally published in M. Breschi and L. Pozzi (eds.), *The Determinants of Infant and Child Mortality in Past European Populations* (Udine, 2004).

186 T. McKeown and R.G. Brown, 'Medical evidence related to English population change in the eighteenth century', *Population Studies*, Vol. 9 (1955).

187 T. McKeown, *The Modern Rise of Population* (London 1976).

188 A. Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (Oxford 1976), Vol. 1, p. 97; T.R. Malthus, *An Essay on the Principal of Population* (Cambridge 1989), Vol. 1, pp. 15, 92, 192, 193.

189 McKeown and Brown 'Medical evidence', p. 139.

190 McKeown, *The Modern Rise.*

191 See R. Woods, *The Demography of Victorian England & Wales* (Cambridge 2000), pp. 190-202. Also see N. Williams, 'Death in its season: class, environment and the mortality of infants in nineteenth century Sheffield', *Social History of* Medicine, Vol. 5 (1992), pp. 71-94; E. Garrett, A. Reid, S. Szreter and

we will argue that "place" in the form of disease environment was critical in shaping mortality in the period before the twentieth century.

McKeown rightly pointed out that there were difficulties in examining long-term changes in mortality, because of the deficiencies in evidence before the advent of civil registration in England & Wales in 1837.[192] However, McKeown's work itself has come under strong criticism, including the observation that there was a significant increase in life expectancy amongst the aristocracy and other elite groups who had always had access to an abundance of food.[193] McKeown recognised that this presented a major problem for his explanation of falling mortality, but argued that decreasing elite mortality was the result of diminishing exposure to infection due to improved health and nutritional standards amongst the general population.[194] In support of his argument, McKeown suggested that improvements in life expectancy occurred first amongst the general population, and only later amongst the wealthy and aristocracy.[195] This is clearly an empirical matter that can only be resolved by good quality evidence, but the data on mortality amongst the aristocracy is of questionable quality due to the absence of reliable source material.

Lack of information on births and infant deaths amongst the peerage before 1750 forced Hollingsworth to apply correction ratios which inflated infant mortality rates by about three times for this period.[196] There is also some evidence that the proportion of aristocratic children born in the countryside significantly

---

K. Schurer, *Changing Family Size in England and Wales: Place, Class and Demography, 1891-1911* (Cambridge 2001).

192 T. McKeown and R.G. Record, 'Reasons for the decline of mortality in England and Wales during the nineteenth century', *Population Studies*, Vol. 16 (1962), pp. 94-95.

193 P. E. Razzell, *Essays in English Population History* (London, 1994), pp. 152-153; S.R. Johansson, *Death and the Doctors: Medicine and Elite Mortality in Britain from 1500 to 1800* (Cambridge Group for the History of Population and Social Structure Working Paper Series, 7 1999), pp. 1-8.

194 McKeown , *The Modern Rise*, pp. 139-141.

195 *Ibid*, p. 141.

196 T.H. Hollingsworth, 'The demography of the English peerage', *Population Studies* (Supplement, 1964).

diminished during the eighteenth century,[197] suggesting that "place" may have played an important role in changing patterns of mortality.

For the post-civil registration period it is possible to work with copies of civil registers compiled after 1853 for use by local vaccination officers and Medical Officers of Health, and frequently deposited on open access in county record offices. For the pre-civil registration era one partial solution is be found in the methodological principle of triangulation, involving measurements from a number of perspectives, and cross-tabulating the results. This, in effect, was the method adopted by Alison Weir, in her genealogical study of the British Royal Family, collating information from many different sources.[198] We have analysed this data, summarised in the following table:

Table 4.1: Mortality Amongst The British Royal Family (Sons And Daughters Of Kings And Queens), 1500-1899.

		Period	
		1500-1699	*1700-1899*
Number Of Stillbirths		31	5
Number Of Live Births		57	43
Proportion Of Live Children Who Had Died By			
	One Day	15.8%	4.7%
	One Month	22.8%	4.7%
	One Year	45.6%	9.4%
	Five Years	63.1%	14.1%
	Fifteen Years	63.1%	14.1%
	Fifty Years	85.9%	35.0%

197 An analysis that we have carried out of volumes 1 and 2 of the G.E.C., *The Complete Peerage*, suggests that the proportion of aristocractic children born in the countryside fell from 52 per cent in the late seventeenth century to 28 per cent in the early nineteenth.

198 A. Weir, *Britain's Royal Families* (London 1994).

In 1500-1699, nine of the fifty-seven live-born royal children (sixteen per cent) died on the first day of life, deaths which are normally excluded from studies of infant mortality before the twentieth century.[199] Stillbirths are also not normally recorded, but are registered sufficiently accurately in the royal family to be able to analyse stillbirth rates and how they changed over time. Infant and child mortality fell dramatically amongst the royal family between 1500-1699 and 1700-1899: whereas 63 per cent of all royal children died under the age of five before 1700, this proportion had fallen to 14 per cent by 1700-1899. The ratio of royal stillbirths to live births fell from 54 per cent in 1500-1699 to 12 per cent in the later period. The royal family was the wealthiest in Britain but their wealth did not protect them against an exceptionally high level of mortality in the period before 1700, or explain their decline in mortality after that date.

The numbers of cases in the samples covered by Table 4.1 are very small and it is possible that the very heavy mortality in the earlier period is affected by special genetic characteristics of the royal family. Multiple sources are not available for the general population and special methods are required to ensure that mortality data have a sufficient degree of reliability to address the issues raised by McKeown and his colleagues. We will not discuss the full range of explanatory variables but will focus on the role of poverty and disease environment in shaping mortality patterns. It will necessarily be speculative, presenting hypotheses and theoretical ideas to promote debate and further fruitful lines of research.

The Impact Of The Disease Environment On Mortality

Since Farr's work on the relationship between population density and mortality in the mid-nineteenth century, the importance of geographical place in determining levels of mortality has been well understood.[200] Farr found that large cities and urban areas had significantly higher mortality rates than rural areas, and

---

[199] In most reconstitution studies children dying on the first day are not usually recorded, as most of them had not been baptised, leading to a systematic under-registration of infant mortality.

[200] Woods, *The Demography*, pp. 190-202.

Bowley in the early 1920s found a similar correlation between housing density and mortality levels.[201] It has been assumed that places with greater population sizes and densities would be prone to higher levels of infection, but we will see later that, historically, other geographical factors sometimes negated the association between population size/density and infection.

The concept of disease environment rather than place will be used for analytical purposes, as it focuses on the particular mechanisms for the transmission of disease. It can apply not only to geographical areas, but to domestic environments and even to individuals, in terms of personal hygiene or immunity to external infection acquired, for example, by inoculation and vaccination. One of the problems with analysing the association between disease environment and mortality is that there was frequently a link between the environment and socio-economic status. For example, many more wealthy merchants lived in London than in remote rural areas, and, therefore, when discussing the impact of environment on mortality it is important to, at least initially, control for wealth and socio-economic status.

Infant And Child Mortality: The Influence Of Disease Environment In The Seventeenth And Eighteenth Centuries

There are few historical sources that allow for controlling socio-economic status but one such source of data is that based on Quaker records. Quakers throughout most of their history were a middle class group, and their occupational profile was summarised by Vann and Eversley as follows:

"… a distinctive feature of the Quaker occupational structure is the prominence of wholesale traders, and later of professional men … The most striking difference between Friends and the rest of society, however, is the virtually complete absence, not only of paupers, but also of persons called only labourers."[202]

---

201 A.L. Bowley, 'Death rates, density, population, and housing', *Journal of the Royal Statistical Society,* Vol. 86 (1923).

202 R.T. Vann and D.E.C. Eversley, *Friends in Life and Death* (Cambridge 1992), pp. 72-73.

Quakers also shared a distinctive puritan life style, important when considering the role of such factors as alcohol in the determination of mortality. We have re-analysed Vann and Eversley's Quaker reconstitution schedules, using same-name ratios for correcting mortality levels.[203]

Table 4.2: Estimated Quaker Infant Mortality (Per 1000) In England And Ireland, 1650-99.

Place	*Infants At Risk*	*Infant Deaths*	*Same-Name Ratio*	*Estimated IMR*
London	330	113	12/12	342
Bristol & Norwich	691	117	111/86	219
Provincial England	2781	293	304/181	177
Dublin	591	149	45/38	299
Cork, Wexford, Waterford & Limerick	966	131	54/44	166
Rural Ireland	1953	120	75/56	82

Quaker infant mortality was four times higher in London than it was in rural Ireland, and in general terms the more urbanized an area the higher the infant mortality rate. Rural Ireland had a particularly low infant mortality rate, and this was probably largely due to its geographical isolation, as well as its low population density.

There appear to have been similar geographical variations in infant and child mortality amongst the general population in England during the pre-civil registration period. The following table summarizes the results of reconstitution studies which we have carried out on parishes in London, the towns of Truro and

203 See *Ibid*, pp. 186-238 for a description of their data. Their original reconstitution schedules are deposited in Friends House library in London, and we would like to thank the library for allowing us to use this material.

Ampthill, and nine rural parishes with populations of less than 500 in 1801 from different English counties. The figures are for the earliest period available:

Table 4.3: Estimated Infant And Child Mortality (Per 1000) In English Parishes, 1650-99.[204]

	St. Bartholomew's London	*Truro, Cornwall*	*Ampthill Beds.*	*Nine Rural Parishes*
Infants At Risk	593	1618	798	1440
Infant Burials	100	246	102	108
Children (1-4) At Risk	224	976	566	777
Child (1-4) Burials	37	157	47	51
Same-Name Ratio	58/37	162/113	80/55	70/41
Estimated IMR	264	220	186	128
Estimated CMR	260	231	121	112
IMR + CMR	524	451	307	240

The above mortality figures are minimal, in that they do not include deaths before baptism or the deaths of illegitimate children. Table 4.3 indicates a gradient in mortality running from

[204] The parishes included in the table are part of an initial sample from a larger study and were mainly selected on the basis of the availability of details of fathers and mothers names in the baptism register; parish registers were chosen from the printed and transcribed volumes in the Society of Genealogists' library. The data for all parishes covers the entire period 1650-99, except for Ampthill which covers 1653-1699. The nine rural parishes are Breamore, Weston Colville, Stow Maries, Cusop, Poddington, Kemerton, Eaton Hastings, Canewdon and Woodchurch. All rates were corrected by same-name ratios directly derived from the reconstitution samples.

the London parish to the nine rural parishes.[205] The differences are similar to those found amongst Quakers, and again suggest that population size and density were major factors in shaping mortality patterns. However there are variations between the different parishes which indicate that other factors were at work.

The population size of Truro in the second half of the seventeenth century was about 2,700, and the equivalent size of Ampthill was approximately 1,300.[206] Both were very small towns compared to London, which had a population of about 585,000 at the end of the seventeenth century.[207] Truro's combined infant and child mortality rate – 451/1000 – was nearly as high as that in St. Bartholomew's, London – 524/1000 – and about fifty per cent higher than Ampthill's – 305/1000 – a similarity and difference which requires special comment.

Truro was located near the Cornish coast and was a centre for the trading of tin to many parts of England and the Continent, and, because of its trading activities and wealth, was described by one contemporary as a "town of merchant princes".[208] Ampthill was an inland market town that served mainly a local area, and was not noted either for its trade or wealth.[209] London, of course, was the main trading centre in England, and famed for it prosperity and wealth. We thus have the paradox that the wealthier the town, the higher mortality.[210]

A clue to the explanation of Truro's high mortality lies in a list of smallpox deaths listed in the parish register for the year

---

205 The estimated infant mortality rate for the nine small rural parishes − 128 per 1000 − is relatively low compared to some of the eighteenth century rural rates quoted in the last essay. However, we will see later (Table 4.12 and Table 5.4) that infant mortality increased in the eighteenth century, a pattern similar to that found in Poddington and Elstow in Table 3.10.

206 These population estimates are based on 1801 census figures adjusted by the ratio of baptisms in 1775-1824 to those in 1650-99.

207 E.A. Wrigley and R.S. Schofield, *The Population History of England, 1541-1871* (London 1981), p. 571.

208 V. Acton, *A History of Truro* (Truro 1997), Vol. 1, pp. 93-121.

209 C. Isherwood, *The History of Ampthill* (Ampthill 1921).

210 Mary Dobson has found something similar in the South-Eastern region of England, with mortality generally higher in the wealthier port and marsh districts, and lower in the poorer downland and elevated wealden areas. M. Dobson, *Contours of Death and Disease in Early Modern England* (Cambridge 1997), p. 147.

1767. Of 55 smallpox deaths, 53 were of children, the other two being adults who had come into the town from outside counties – Dorset and Hampshire. 38 of the 53 child deaths were included in the reconstitution study, and the average mean age of death of these 38 children was two years seven months, i.e. most of the smallpox deaths in Truro were of very young children. We do not have a list of smallpox deaths for Ampthill, but one does exist for a similar sized inland market town, Burford in Oxfordshire. There were 181 smallpox deaths in Burford in the epidemic of 1758, of which 78 were of adults, and of the remaining 93 children, it is estimated that 68 were under the age of ten – *i.e.,* only 38 per cent of the total number of smallpox deaths were of young children.[211]

Nearly two-thirds of smallpox deaths in Burford were over the age of ten, a significantly different pattern from that found in Truro. For smallpox to affect mainly young children as it did in Truro, the disease must have been endemic, returning virtually every year to the town. The age structure of smallpox in Burford indicates that the disease only struck infrequently, perhaps every fifteen years or so, explaining the high proportion of adults affected.

There is further evidence that other small inland parishes experienced the same structure of smallpox epidemics as Burford. For example in Godalming, Surrey during the period 1701-23, where epidemics returned about every thirteen years, 76 of the 157 deaths were adults.[212] In Aynho, Northamptonshire during the epidemic of 1723-24, only 28 of 132 cases of smallpox – 21 per cent – and 4 of the 25 smallpox deaths – 16 per cent – were of children under the age of ten.[213] During the general smallpox inoculations that took place in rural parishes after the late 1760s, many of those inoculated were adults.[214]

---

211 These figures are calculated from J. Moody, *The Great Burford Smallpox Outbreak of 1758* (Burford 1998).

212 *Surrey Archaelogical Collections,* Vol. 27 (1914), pp. 16-20.

213 P.E. Razzell, *The Conquest of Smallpox* (London 2003), p. 167.

214 *Ibid*, p.120.

The age incidence of smallpox is not only important for its direct impact on mortality, but also as a measure of the epidemiological nature of different disease environments. In towns like London and Truro, a whole range of diseases probably occurred in early childhood from infections being regularly imported via trading activity and contact with the outside world.[215]

However, England was probably protected from much infection through its barrier island status. Inland parishes, away from main routes of communication, appear to have suffered from less infectious disease and therefore had lower mortality levels. This can be illustrated with respect to the rural parishes covered by the present research. The following table lists the infant and child mortality rates of the nine individual rural parishes for the whole period 1650-1849.[216]

---

215 Smallpox is known to have been mainly a disease of young children in London, during the eighteenth century. J. Landers, 'Mortality and metropolis: the case of London, 1675-1825' *Population Studies,* Vol. 41 (1987), p. 74.

216 Infant and child mortality rates were compiled by applying the appropriate same-name inflation ratios. For full details see P.E. Razzell and C. Spence, 'Poverty or disease environment? The history of mortality in Britain, 1500-1950', M. Breschi and L. Pozzi (eds.), *The Determinants of Infant and Child Mortality in Past European Populations* (Udine, 2004), p. 50.

Table 4.4: Estimated Infant And Child Mortality (Per 1000) In Nine English Rural Parishes, 1650-1849.

Parish	*Number Of Infants At Risk*	*Number Of Children (1-4) At Risk*	*IMR*	*CMR*	*IMR + CMR*
Breamore, Hampshire	1683	1148	79	50	129
Kemerton, Worcestershire	1035	613	100	47	147
Weston Colville, Cambridgeshire	1150	789	130	71	201
Cusop, Herefordshire	599	372	144	59	203
Eaton Hastings, Oxfordshire	569	411	142	77	219
Woodchurch, Kent	2023	1183	132	104	236
Poddington, Bedfordshire	1523	1301	160	84	244
Candewdon, Essex	539	324	202	123	325
Stow Maries, Essex	573	285	198	170	368

The lowest combined infant and child mortality rate was found in Breamore, Hampshire, a small scattered inland parish in the New Forest away from any major route of communication. A clue to the very low mortality in this parish is found in its burial register: up to the year 1803, there were only twelve smallpox deaths listed, of which ten were adults. This suggests that Breamore managed to avoid much infection during the eighteenth century through its isolated position.

Low mortality in some of the other parishes in Table 4.4 is also probably related to isolated inland location. On the other

hand, the two Essex parishes – Canewdon and Stow Maries – had very high infant and child mortality rates. This may have been partly due to their coastal location, but was more likely a result of them being estuarine marsh parishes with endemic malaria.[217] This indicates that high mortality was not always a function of epidemic infection, but could be the result of endemic environmental conditions.

Adult Mortality: The Impact Of Disease Environment In The Early Eighteenth Century

The government levied a tax in 1710 on all apprenticeship indentures, and the registers of taxation paid have survived for the period 1710-1809. Up to the middle of the eighteenth century the registers give information on the apprentice's name, father's name and occupation, place of residence, whether the father was alive or dead at the date of the apprenticeship, and the premium paid by the apprentice's family for the apprenticeship. The national apprenticeship register lacks data on the ages of fathers, and there is always the potential problem of the reliability of this type of data, although early research indicates that information in the national register was of a very high quality in the early period 1710-13.[218]

The evidence from this register suggests that the association between disease environment and infant/child mortality was mirrored in the pattern of adult mortality. Table 4.5 summarises the evidence on geographical region and paternal mortality.

---

217 Dobson, *Contours of Death.*

218 The national register of apprenticeships has been transcribed and lodged in the Society of Genealogists' library. A comparison was made between information in this register and that contained in the London guild records published and edited by Cliff Webb. See C. Webb, *London Apprentices* (London 1996-98). Fifty cases were selected alphabetically from volumes 1 − 15 of *London Apprentices* for the period 1710-13 and traced in the national register. Of these fifty cases the information on the death of the father was identical in both sets of records. Examination of later cases suggests that the quality of information on whether the father was alive or dead began to deteriorate after about 1713.

Table 4.5: Mortality Amongst Fathers Listed In The British Apprenticeship Register 1710-1713 By Area Of Residence Of Father.[219]

Geographical Region Of Residence	*Number Of Cases*	*Proportion Of Fathers Dead %*
London & Middlesex	372	37
Surrey, Kent, Hampshire & Sussex	234	35
Cambridgeshire, Suffolk, Norfolk, Lincolnshire, Essex & Huntingdonshire	355	32
Devon, Cornwall, Dorset, Herefordshire, Gloucestershire, Shropshire, Wiltshire, Somerset & Worcestershire	411	30
Bedfordshire, Berkshire, Buckinghamshire, Hertfordshire, Northamptonshire & Oxfordshire	206	28
Cheshire, Durham, Lancashire, Cumberland, Northumberland, Rutland, Westmoreland & Yorkshire	336	27
Scotland	151	22

219 The source of this data is the *National Apprenticeship Register*, Volumes 1-6, in the Society of Genealogists' library.

Although the mortality gradient is not as sharp or linear as that found for infant and child mortality, adult mortality appears to have been highest in the wealthiest area of the country − London − and lowest in the poorest remote region, Scotland.[220] Levels of adult mortality in 1710-13 were probably partly determined by proximity to London the main reservoir of disease infection. Additionally, trading and other activities were associated with the spread of infection, partially explaining the association between the wealth of a region and its mortality.[221] There is also some evidence to suggest that wealth was directly associated with higher levels of mortality as a result of life-style factors − the consumption of rich foods, alcohol and tobacco, accompanied by physical inactivity − a theme which is discussed later in the book.

Infant And Child Mortality: The Role Of Wealth And Poverty In Seventeenth And Early Eighteenth Century.

The following table summarises estimates of infant and child mortality among socio-economic elite and non-elite families in St. Bartholomew's, London and Truro, Cornwall during the early modern period, using family reconstitution techniques. Elite families were essentially wealthy merchants and professionals identified through information in parish register and other sources.[222]

---

220 R.S. Schofield, 'The geographical distribution of wealth in England, 1334-1649', *Economic History Review,* Vol. 18 (1965); C. Husbands, 'Hearths, wealth and occupations: an exploration of the hearth tax in the later seventeenth century', K. Schurer and T. Arkell (eds.), *Surveying the People* (Local Population Studies, 1992), p. 76.

221 Within the London region, there was a similar relationship in the nineteenth century between distance from the centre of the city and mortality. Woods, *The Demography*, pp. 376-377. For a discussion of the importance of exposure to infection for determining mortality levels see Landers, *Death and the Metropolis*, 29-32; Johansson, *Death and the Doctors*, pp. 5-6.

222 The elite were designated in the parish register by the title of "Mr", "Gentleman" or "Esquire". For fuller details of how this data was compiled, including how elite families were defined, see Essay 5.

Table 4.6: Estimated Infant And Child Mortality (Per 1000) Amongst Socio-Economic Elite And Non-Elite Families In St. Bartholomew's, London, And Truro, Cornwall, 1619-1750.

Parishes And Period	*Socio-Economic Status*	*Infants At Risk*	*Children (1-4) At Risk*	*IMR*	*CMR*	*IMR + CMR*
Saint Barts., London, 1619-1749	Elite Families	372	199	306	302	608
	Non Elite Families	1122	370	265	274	539
Truro, Cornwall 1629-1750	Elite Families	694	396	239	229	468
	Non Elite Families	2541	1587	181	225	406

Both infant and child mortality were higher among elite than non-elite families in St. Bartholomew's, London, whereas in Truro, although infant mortality was higher amongst the wealthy, there was little difference in child mortality. The St. Bartholomew's figures must be treated with some caution, as there was a great deal of migration in the sample population resulting in a truncated observation of families, particularly amongst the non-elite. There is however data available for city of London parishes using the 1695 Marriage Duty enumeration listing, which although covering a more restricted period, increases the number of families in observation through infancy to childhood. The 1695 listing was carried out for taxation purposes and gives information on families owning real estate of £600 or more, and the following table summarises data on family wealth and mortality for London parishes and Lyme Regis in Dorset for which data on wealth is also available.[223]

[223] For further details of the methodology used in creating the data summarised in this table, see Essay 1. The definition of wealth holding families in Lyme Regis was broader than that in London, and includes tradesmen and artisans leaving wills and paying window tax.

Table 4.7: Estimated Infant And Child Mortality (Per 1000) Amongst Wealth And Non-Wealth Holding Families In City Of London Parishes And Lyme Regis, Dorset.[224]

Parishes And Period	*Socio-Economic Status*	*Number Of Infants At Risk*	*Number Of Children (1-4) At Risk*	*IMR*	*CMR*	*IMR + CMR*
City Of London Parishes, 1680-1710	Wealth Holders	498	359	289	181	470
	Non Wealth Holders	477	310	390	186	576
Lyme Regis, Dorset, 1660-1720	Wealth Holders	246	210	157	231	388
	Non Wealth Holders	299	265	104	220	324

In the London city parishes, infant mortality was lower amongst wealthy than non-wealthy families, whereas there was no significant difference in child mortality between the two groups. In Lyme Regis both infant and child mortality were higher amongst elite families, although the difference in child mortality was relatively insignificant.

The overall conclusion from the data in Tables 4.6 and 4.7 is that infant mortality was greater amongst the wealthy than the non-wealthy in three of the four sample populations, but that it was lower amongst elite families in the London city parishes. Wealth appears to have made little difference in child mortality in any of the parishes in the early modern period.

[224] For full details of how the figures in this table are calculated see Essay 1.

A reconstitution study of a number of parish registers with information on occupation during the period 1674-1749 yields the following results.[225]

Table 4.8: Estimated Infant And Child Mortality (Per 1000) By Occupational Status In Ten Parishes, 1650-1749.[226]

Occupation Status	*Infants At Risk*	*Children (1-4) At Risk*	*Estimated IMR*	*Estimated CMR*	*IMR + CMR*
Merchants, Professionals & Gentlemen	341	238	185	112	297
Farmers, Tradesmen & Artisans	1896	1338	187	115	302
Labourers & Paupers	1286	797	151	129	283

Infant mortality was lower amongst labourers and paupers than it was in other socio-economic status groups, although higher child mortality amongst labourers and paupers meant there was little overall difference between the groups.

225 The ten parishes are: Weston Colville, Cambridgeshire; Woodford, Kent; Bedford St. Pauls, Bedfordshire; Highworth, Wiltshire; Ampthill, Bedfordshire; Clayworth, Nottinghamshire; Swindon, Wiltshire; Rochester, Kent; Woodchurch, Kent; Ackworth, Yorkshire. The parishes selected for study are ones which include information on occupation in the register or in a contemporary census lodged in the Society of Genealogists' library.

226 The same-name inflation ratios applied were as follows: Professional & Gentlemen – 31/28; Farmers & Traders: 192/153; Labourers – 128/107. For full details of how the figures in this table were calculated see Razzell and Spence, 'Poverty or disease environment?', p. 53.

Adult Mortality: The Role Of Socio-Economic Status In The Early Eighteenth Century

Information in the national apprenticeship register on father's occupation, premiums paid, and paternal mortality allows an analysis of socio-economic status and adult mortality at the beginning of the eighteenth century. The smallest premiums were paid by families whose fathers were listed as labourers and husbandmen, and the highest premiums by professional, merchant and gentry families.[227]

Table 4.9: Mortality Amongst Fathers Listed In The British Apprenticeship Register 1710-13 By Amount of Premium Paid

Premium Paid	*Number Of Cases*	*Proportion Of Fathers Dead %*
£1-£5	541	22.9
£6-£19	587	30.2
£20+	532	34.0

Table 4.9 indicates a negative association between wealth and adult mortality among apprentices' fathers, although it does not allow for possible age differences of fathers in the three premium groups.[228] The link between wealth and mortality might be partly explained by the wealthy living more frequently in London and other unhealthy towns and cities, but even within those unhealthy areas there was an association between wealth and mortality.

[227] For example, the average premium paid by 61 labourers and husbandmen's families in volume 5 of the national apprenticeship register was £7.00, whereas the equivalent figure amongst 72 professional, merchant and gentry families was £105.00.

[228] The inverse association between wealth and mortality might be partly explained by wealthier families apprenticing their sons at a later age. A sample of 50 cases from each premium category indicates that the average ages of apprenticeship in the £1-£5 group was 14.4 years; £6-£14 category 14.9 years, and £15+ group 15.9 years. However, even allowing for these age differences, the mortality rate of fathers was still higher in the wealthier premium groups: 1.6 per cent per annum in the £1-£5 category, 2.0 per cent in the £6-£14 one, and 2.1 per cent in the £15+ group.

Table 4.10: Mortality Amongst London Fathers Listed In The British Apprenticeship Register 1710-13 By Amount Of Premium Paid.[229]

Premium Paid	*Number Of Cases*	*Proportion Of Fathers Dead %*
£9 And Under	110	31.8
£10-£19	93	40.9
£20+	99	42.4

Although the number of cases is small, there is still the same linear gradient between wealth and mortality in London as found nationally.

The overall data considered in this essay suggests that in the early modern period before the middle of the eighteenth century, there was no significant association between poverty and mortality, but that on the contrary, mortality – particularly adult mortality – was higher amongst the wealthy than amongst the poor.

Disease Environment And Changes In Infant And Child Mortality Over Time

Quaker data enables an analysis of changes in infant mortality for a particular and distinct social group, allowing for variations in disease environment.

229 For the source of this data see the National Apprenticeship Register, Volumes 1-6 in Society of Genealogists' library.

Table 4.11: Estimated Infant Mortality (Per 1000 Births) Amongst Quakers In Great Britain, 1650-1849.[230]

Period	*London*	*Bristol & Norwich*	*Provincial England*	*Dublin*	*Cork, Wexford, Waterford & Limerick*	*Rural Ireland*
1650-1699	342	219	177	299	166	82
1700-1749	269	216	200	196	160	118
1750-1799	166	158	124	164	151	82
1800-1849	132	107	69	107	65	41

Infant mortality rose in Provincial England and Rural Ireland between 1650-1699 and 1700-1749, before reducing significantly, whereas in other regions if fell throughout the entire period 1650-1849. The first reductions appear to have occurred in London and Dublin, and later in provincial and rural areas. However, an independent study by Landers suggests that infant mortality amongst London Quakers did not fall until after 1750,[231] a contradictory finding. According to Table 4.11, the urban rural

[230] See R.T. Vann and D.E.C. Eversley, *Friends in Life and Death* (Cambridge 1992), pp. 186-238 for a description of their data. We have re-analysed their reconstitution schedules deposited in Friends House library in London. The number of infants at risk and the same name inflation ratios (in brackets) were for each period as follows: London: 1650-99: 330 (12/12), 1700-49: 519 (52/51), 1750-99: 300 (28/24), 1800-49: 72 (4/3); Bristol & Norwich: 1650-99: 691 (111/86), 1700-49: 990 (133/119), 1750-99: 1062 (120/111), 1800-49: 505 (31/28); Provincial England (England minus London, Norwich and Bristol): 1650-99: 2781 (304/181); 1700-49: 3768 (330/188), 1750-99: 4332 (246/208), 1800-49: 3381 (68/61); Dublin: 1650-99: 591 (45/38), 1700-49: 625 (40/36), 1750-99: 623 (36/29), 1800-49: 270 (15/14); Cork, Wexford, Waterford and Limerick: 1650-99: 966 (54/44), 1700-49: 1402 (62/52), 1750-99: 1300 (73/68), 1800-49: 676 (13/13); Rural Ireland: 1650-99: 1953 (75/56); 1700-49: 2964 (139/111), 1750-99: 2487 (132/119), 1800-49: 513 (10/9).

[231] J. Landers, 'London mortality in the "long eighteenth century": a family reconstitution study', *Medical History,* (Supplement No. 11, 1991), p. 7.

gradient was sustained over the whole period 1650-1849, although there were sharp falls in infant mortality in all areas. An analysis of the reconstitution parishes included in the present research, and nineteen parishes covered by the Cambridge Group, reveals the following pattern of changing infant and child mortality: [232]

Table 4.12: Estimated Infant And Child (1-4) Mortality Rates (Per 1000) In St. Bartholomew's London, Truro, Ampthill, Nineteen Cambridge Group Parishes, And Ten Small Rural Parishes, 1650-1837.

Period	*Infant Mortality Rate*				
	Saint Barts., London	Truro, Cornwall	Ampthill, Bedfordshire	Nineteen Cambridge Group Parishes	Ten Small Rural Parishes
1650-99	264	218	186	188	134
1700-49	342	177	204	193	166
1750-99	206	145	131	163	146
1800-37	-	90	103	122	89
Period	*Child (1-4) Mortality Rate*				
1650-99	260	231	121	105	118
1700-49	274	224	119	103	89
1750-99	114	228	102	95	87
1800-37	-	103	103	74	66

[232] Details of the corrected Cambridge Group's nineteen reconstitution parish data are to be found on p. 70. For the other areas, the data is derived from an analysis of parish registers in the Society of Genealogists' library, using the reconstitution rules outlined in Essay 1. The number of baptisms (B) and children at risk (CR), with the same-name correction ratios in brackets, are as follows: St. Bartholomew's: 1650-99: B: 592, CR: 224 (57/37), 1700-49: B: 564, CR 202 (60/32), 1750-99: B:247, CR: 92 (13/8); Truro: 1650-99: B: 1139, CR: 687 (114/80); 1700-49: 1615, CR: 1007 (186/165); 1750-99: B: 1837, CR: 1142 (213/175); 1800-37: B: 1431, CR: 707 (96/74); Ampthill: 1653-99: B: 798, CR: 566 (80/55), 1700-49: B: 1058, CR: 722 (98/83), 1750-99: B: 1118, IR: 864 (73/43), 1800-37: B: 1045, CR: 737 (41/21); Ten Small Rural Parishes: 1650-99: B: 1534, CR: 856 (79/43), 1700-49: B: 2879, CR: 1857 (204/156), 1750-99: B: 3686, CR: 2537 (214/142), 1800-37: B: 2719, IR: 1401 (110/86). The ten small rural parishes are: Ackworth, Yorkshire; Breamore, Hampshire; Canewdon, Essex; Cusop, Herefordshire; Eaton Hastings, Oxfordshire; Kemerton, Worcestershire; Poddington, Bedfordshire; Stow Maries, Essex; Weston Colville, Cambridgeshire; Woodchurch, Kent. No figures are available for St. Bartholomew's for 1800-37 due to the smallness of samples during this period.

The pattern of change in mortality is complex, but generally infant and child mortality appears to have diminished earlier in London, Truro and Ampthill, than it did in the more rural parishes. However, child mortality in Truro fell almost exclusively in the early part of the nineteenth century, as did much of the infant and child mortality in the Cambridge Group's reconstitution sample and the ten small rural parishes. The infant mortality figures must be interpreted with some care, particularly for the late eighteenth and early nineteenth century. As we have seen previously, the interval between birth and baptism generally increased during the eighteenth century, so that, for example, data for St. Bartholomew's shows that the proportion of children baptized within two weeks of birth dropped from 89 per cent in 1650-99 to 22 per cent in 1750-99. Much of this increase in the interval between birth and baptism was probably the consequence of reduced infant and child mortality.[233]

The conclusions about early falling infant and child mortality in London are confirmed by evidence from the London Bills of Mortality, which indicates that mortality of young children reduced significantly from about 1750 onwards.[234] Another contemporary set of bills of mortality – those for Northampton − also indicates that infant and early child mortality fell during the same period, although mortality appears to have diminished at an earlier date and more significantly in London than it did in Northampton.[235] The above evidence suggests that infant and child mortality falls first took place in London, spread to provincial towns, and then to rural areas.

---

233 For evidence of parents baptizing children as a result of sickness and impending mortality see Dobson, *Contours of Death,* p. 297.

234 The ratio of burials under two as a proportion of baptisms in London were as follows: 1730-39: 59.8%; 1740-49: 60.8%; 1750-59: 50.8%; 1760-69: 33.1%; 1770-79: 33.1%; 1780-89: 38.0%; 1790-99: 26.4%; 1800-09: 21.8%; 1810-19: 20.0%. These figures are derived from J. Marshall, *Mortality in the Metropolis* (London 1832). For a detailed discussion of London's mortality history see P.E. Razzell and C Spence, 'The history of infant, child and adult mortality in London, 1550-1850', *The London Journal* (Forthcoming, 2007).

235 The ratio of burials under two as a proportion of baptisms in Northampton was: 1740-49: 43.5%; 1750-59: 35.0%; 1760-69: 49.4%; 1770-79: 44.6%; 1780-89: 38.0%; 1790-99: 26.4%; 1800-09: 21.8%; 1810-19: 20.0%. These figures are based on the bills of mortality lodged in the Northampton Public Library.

Socio-Economic Status And Changes In Infant And Child Mortality Over Time

Reconstitution data on changes in the relationship between socio-economic status and mortality is difficult to generate because of the relatively small number of elite socio-economic families found in most communities. However, there are some places that contained sufficient numbers of wealthy families to allow an analysis. For example in Truro, between twelve and thirty-seven per cent of all families were classified in the parish registers and other sources as being members of the local socio-economic elite, made up mainly of merchants and professional families.[236]

Table 4.13: Socio-Economic Status And Estimated Infant/ Child Mortality (Per 1000) In Truro, Cornwall, 1629-1837.

	Elite Families			*Non-Elite Families*		
Period	*IMR*	*CMR*	*IMR + CMR*	*IMR*	*CMR*	*IMR + CMR*
1629-99	271	237	508	201	237	438
1700-49	188	213	401	175	225	400
1750-99	162	135	297	142	244	386
1800-37	66	25	91	93	116	209

Whereas in the seventeenth century infant mortality was significantly higher amongst the socio-economic elite, by the early nineteenth century the reverse was the case.[237] There was a

236 The data in this table is based on an analysis of the Truro parish register lodged in the Society of Genealogists' library. Elite families include merchants, professionals and gentlemen; non-elite are all minus elite families. The number of baptisms (B) and children at risk (CR), with same-name correction ratios in brackets, are: Elite Families: 1629-1699: B: 435, CR: 244 (59/47), 1700-1749: B: 259, CR: 152 (27/25), 1750-1799: B: 280, CR: 164 (28/24), 1800-1837: B: 190, CR: 100 (5/4); Non-Elite Families: 1629-1699: B: 1183, CR: 732 (103/66), 1700-1749: B: 1356, CR: 855 (156/140), 1750-1799: B: 1557, CR: 978 (185/151), 1800-1837: B: 1241, CR: 607 (91/70).

237 The infant mortality figures must be interpreted however with some caution. The proportion of children baptised within two weeks fell from 28 per cent in 1794-99 to 15 per cent in 1800-12.

particularly sharp fall in infant mortality amongst the wealthy at the beginning of the eighteenth century, and significant reductions in child mortality at the end of the eighteenth and beginning of the nineteenth century. A gradual fall in infant mortality occurred amongst other families during the eighteenth century, but the most significant reduction in both infant and child mortality amongst this group occurred at the beginning of the nineteenth century.

No other data of similar quality is available for other places, but a reconstitution analysis of occupational status and mortality in eleven parishes at the beginning of the nineteenth century, corrected by same-name ratios, reveals the following pattern:

Table 4.14: Occupational Status And Estimated Infant/ Child Mortality (Per 1000) In Eleven Parishes, 1812-37.[238]

Occupational Status	*IMR*	*CMR*	*IMR + CMR*
Merchants & Professional	70	19	89
Farmers, Tradesmen & Artisans	91	82	173
Labourers & Paupers	95	72	167

Whereas there was no significant relationship between occupational status and infant/ child mortality during the period 1650-1749 in the group of parishes covered by Table 4.8, infant and child mortality amongst merchants and professionals in the group of parishes in Table 4.14 appears to have been lower than the other socio-economic status groups at the beginning of the nineteenth century.

---

238 The eleven parishes are: Ampthill, Bedfordshire; Breamore, Hampshire; Cusop, Herefordshire; Canewdon, Essex; Cattistock, Dorsetshire; Elstow, Bedfordshire; Poddington, Bedfordshire; St. Bartholomew's, London; Truro, Cornwall; Weston Colville, Cambridgeshire; Woodchurch, Kent. Data is based on the analysis of parish registers in the Society of Genealogists' library. The number of baptisms (B) and children at risk (CR), with the same-name ratios in brackets are: Merchants & Professional: B: 193, CR: 85 (11/10); Farmers, Tradesmen & Artisans: B: 2339, CR: 1417 (125/104); Labourers & Paupers: B: 3353, CR: 2510 (71/62).

For the later nineteenth century, a study of infant and child mortality in Ipswich in the 1870s using copies of the civil birth and death registers,[239] reveals the following pattern:

Table 4.15: Social Class And Infant And Child (1-4) Mortality Rates (Per 1000) In Ipswich 1872-1880.[240]

Social Class	*IMR*	*CMR*
1	119	65
2	145	95
3	151	129
4	146	126
5	137	122

Infant mortality in Ipswich was slightly lower amongst social class 1 − professionals and merchants − than other social groups, whereas child mortality was significantly lower in social classes 1 and 2 than among other groups. This is similar to the findings summarised in Tables 4.13 and 4.14 above, indicating that in some communities by the nineteenth century there was a strong social gradient in child mortality, but only a minimal one for infant mortality.

Data for a later period indicates that there was a significant sharpening over time of the infant mortality gradient by occupational status group.[241]

---

239 Infant and child mortality rates were calculated by using a modified family reconstitution methodology. The classification of social class essentially followed that by Stevenson in his analysis of fertility and child mortality in the 1911 Census. See General Register Office, *Seventy-Fourth Annual Report* (Parliamentary Papers, 1912-13/ XIII.), pp. 73-87.

240 The number of births (B) and children at risk (CR) are: Social Class 1: B: 1293, CR: 875; Social Class 2: B: 2062, CR: 1427; Social Class 3: B: 2755, CR: 1866; Social Class 4: B: 3145, CR: 2245; Social Class 5: B: 2850, CR: 2128. For further details see P.E. Razzell, E. Garrett and R.S. Davies, *The Sociological Study of Fertility and Mortality in Ipswich 1872-1881.* (Report submitted to the Economic and Social Research Council, 2001).

241 This data was generated as a part of the research on the history of infant mortality carried out at the Open University. See M. Drake and P.E. Razzell, *The Decline of Infant Mortality in England and Wales 1871-1948* (Interim Report to the Wellcome Trust, 1999).

Table 4.16: Infant Mortality Rates (Per 1000) By Occupational Group In The District Of Ipswich, Suffolk, 1875-1911.[242]

Period	*Professional*	*Clerks*	*Carpenters*	*Labourers*
1875-1895	112	102	144	175
1896-1905	94	114	148	185
1906-1911	62	49	105	144

Infant mortality diminished most significantly amongst the families of professionals and clerks, so that the gradient in mortality increased significantly between 1875 and 1911. A similar pattern emerged in the registration district of Warwick.

Table 4.17: Social Class And Infant Mortality (Per 1000) In Warwick, 1876-1918.[243]

Period	*Social Class*			
	1 & 2	*3*	*4*	*5*
1876-1879	117	100	104	109
1880-1889	92	102	135	124
1898-1909	83	102	97	117
1910-1918	66	80	97	113

242 This data is based on vaccination birth registers and copies of civil death registers in Ipswich Record Office. Infant mortality rates were calculated by expressing infant deaths as a proportion of births. The numbers of births in each occupational group are: Professional: 1875-95: 349, 1896-1905: 374, 1906-11: 227; Clerks: 1875-95: 394, 1896-1905: 508, 1906-11: 306; Carpenters: 1875-95: 694, 1896-1905: 722, 1906-11: 343; Labourers: 1875-95: 2404, 1896-1905: 3366, 1906-11: 2111.

243 This data is derived from vaccination birth and infant death registers in the Warwick Record Office. Infant mortality rates were compiled by dividing the number of infant deaths by the number of births in each social class category. The social class categories are based on the Stevenson's classification, except that we have included farmers in the composite professional and intermediate group, and agricultural labourers in the unskilled category. The numbers of births in each social class category are: Social Class 1 & 2: 1876-79: 290, 1880-89: 715, 1898-1909: 836, 1910-18: 456; Social Class 3: 1876-79: 657, 1880-89: 1748, 1898-1909: 1576, 1910-18: 1043; Social Class 4: 1876-79: 251, 1880-89: 764, 1898-1909: 965, 1910-18: 601; Social Class 5: 1876-79: 580, 1880-89: 1293, 1898-1909: 985, 1910-18: 604.

There was a minimal social class gradient in Warwick during the first period 1876-79, but by the 1910s there was nearly a two to one difference in infant mortality between the professional & intermediate group and the unskilled social class category. The changing pattern was mainly the result of reductions in mortality among the middle class professional and business group.

The pattern of an increasing social class gradient at the end of the nineteenth century is confirmed by national civil registration figures. The decline in mortality between 1896 and 1911 was particularly great amongst intellectual middle class groups – professional, teachers and clerical workers – while infant mortality only fell slightly amongst working class occupations – textile workers, miners and farm workers. Although infant mortality continued to fall amongst all groups during the first half of the twentieth century, there was still a two to one difference at the extremes of the gradient in 1949-50.[244] However, these national figures do not allow an analysis of the influence of place and disease environment on the relationship between socio-economic status and infant mortality.

Socio-Economic Status And Changes In Adult Mortality Over Time

Marriage licences for East Kent yield data on occupation and paternal mortality for 289 parishes in the period 1619-1809. The following table gives the percentages of dead fathers of under-age daughters by occupational group:

244 M.R. Haines, 'Socio-economic differentials in infant and child mortality during mortality decline: England and Wales, 1890-1911', *Population Studies*, Vol. 49 (1995), p. 313.

Table 4.18: Paternal Mortality Amongst Fathers Of Spinsters Marrying Under 21, By Occupation Of Husband In East Kent, 1619-1809.[245]

Period	*Occupation Of Groom − Proportion Of Spinsters' Fathers Dead*				
	Gentlemen, Merchants & Professional %	*Yeoman & Farmers* %	*Traders & Artisans* %	*Husbandmen* %	*Mariners & Fishermen* %
1619-1646	39	41	46	50	42
1661-1700	38	42	49	39	45
1751-1809	28	15	26	19	24

Table 4.18 indicates that mortality diminished amongst all social groups in the eighteenth century, but gentlemen, merchants and professionals experienced the smallest reduction in mortality of all groups and had the highest mortality at the end of the period 1751-1809. There is some evidence that this was also the case in Nottinghamshire and Sussex.[246]

245 For the details and source of this data see Razzell, *Essays in English Population History*, p. 197.

246 For the source of data see Macleod, *Sussex Marriage Licences*, Vols. 32 & 35; Blagg, *Abstracts of the Bonds and Allegations for Nottinghamshire Marriage Licences*; Shaw, *Nottinghamshire Marriage Bonds, 1791-1800*; E.W.D. Penfold (ed.), *Calendar of Sussex Marriage Licences ... for the Archdeaconary of Lewes, 1772-1837* (Sussex Record Society, Vols. 25 & 26, 1917 and 1919). All marriages with occupational information were extracted from these sources for the period covered.

Table 4.19: Paternal Mortality Amongst Fathers Of Brides And Grooms Marrying Under 21 In Nottinghamshire And Sussex, 1754-1800.

Occupational Group	*Total Number Of Cases*	*Number Of Dead Fathers*	*Proportion Of Dead Fathers %*
Labourers & Servants	225	36	16
Husbandmen	180	34	19
Artisans & Tradesmen	582	123	21
Farmers & Yeomen	457	76	17
Gentlemen &Professionals	92	32	35

The overall pattern of paternal mortality is similar to that found in Kent and elsewhere in the eighteenth and early nineteenth centuries: high adult mortality amongst the very wealthy and lower mortality amongst the general population.[247]

There is however other evidence that elite groups did experience sharp gains in adult life expectancy during the eighteenth century.

Table 4.20: Expectation of Life (Years) for Males Aged 25, 1600-1824.[248]

Period					
	Aristocracy	*Members Of Parliament*	*Tontine Nominees*	*Scottish Advocates*	*Fathers Listed In Marriage Licences*
1600-49	25	–	–	29	27
1650-99	27	26	28	31	29
1700-49	32	31	35	38	–
1750-99	36	37	36	38	38
1800-34	37	38	–	–	–

247 See Essay 4.

248 Razzell, *Essays in English Population History* p. 201.

The quality of evidence for most of these groups is high, but that for Members of Parliament is particularly good, with full information on birth date, entry to Parliament and date of death for over 90 per cent of cohort members. Members of Parliament and the aristocracy came from all areas of the country and probably lived in both town and country, whereas tontine nominees and Scottish advocates lived mostly in large towns and cities during the period covered by Table 4.20.[249]

There was a gain of about 12 years in adult life expectancy amongst both the aristocracy and Members of Parliament, much of it occurring in the first half of the eighteenth century. There is no information of similar quality for the general population, although the data for fathers listed in marriage licences, which covers a wide spectrum of socio-economic groups, indicates that the gains in adult mortality were not confined to the elite.

The evidence on wealth and adult mortality at a later period in the nineteenth century is ambiguous. Chadwick and others produced data to show that the wealthy lived longer than the poor, but this material was generated through a faulty methodology, using age at death as a measure of life expectancy, without allowing for the age structure of the population at risk.[250] The eminent Victorian actuary, Neison, produced a range of evidence to show that adult mortality was higher amongst the wealthy than the poor.[251] Neison's data however was based on individuals who were self-selected, and did not allow for variations in place of residence and the impact of different disease environments.

More reliable figures for a wider range of occupations were published by the Registrar-General at the end of the nineteenth century. There was little or no association between social-economic status and adult mortality in 1860-61 & 1871, but

---

249 Evidence on residence of Tontine Nominees is found in F. Leeson, *A Guide to the Records of the British State Tontines and Life Annuities of the 17th and 18th Centuries* (Isle of Wight 1968). For Scottish advocates see R. Houston, 'Mortality in early modern Scotland', *Continuity and Change*, 7 (1992). For the aristocracy see Hollingsworth, 'The demography of the peerage'.

250 E. Chadwick, *Report on the Sanitary Condition of the Labouring Population of Great Britain, 1842* (Edinburgh 1965)

251 F.G.P. Neison, *Contributions to Vital Statistics* (London 1864), p. 151.

a linear gradient had begun to emerge by the first decade of the twentieth century. The white-collar group had the lowest adult expectation of life in the first period, 1860-61 and 1871. There were only modest gains in adult life expectancy amongst the skilled manual and semi-skilled groups before 1900-02, but significant increases amongst the middle class groups during this period, particularly the white-collar category. There were subsequent gains amongst all groups, but the evidence suggests that the middle classes were the first to benefit from mortality improvements.[252]

Although there are no standardised figures available for the period before 1921, there appears to have been an increase in the social class gradient in adult mortality during the early twentieth century. By 1921 the ratio of standardised adult mortality between Class I and Class V was 82 to 125. During the 1920s, 1930s and 1940s the class gradient appears to have stabilised, with adult mortality in Class V being about 40 to 50 per cent higher than in Class I.[253] However, none of the national figures allow an analysis of socio-economic status and adult mortality by place and disease environment.

Conclusion

Adult mortality in Britain was probably generally higher amongst the wealthy during the seventeenth and first half of the eighteenth century, as was infant mortality in some communities. However, the data reviewed suggests the relationship between poverty, disease environment and mortality was highly complex. The wealthy are known to have fled London and other towns during the plague, to have escaped childhood diseases such as smallpox by moving away from areas known to be affected by the disease,

---

252 Woods, *The Demography*. We have not discussed the unskilled category as it excludes labourers who were the largest occupational group in the country. Labourers had one of the lowest adult mortality rates in 1860-61 and 1871, but data is not available for the whole of the second half of the nineteenth century. See General Register Office, *Supplement to the Thirty-Fifth Annual Report* (Parliamentary Papers 1875/XVIII), pp. clxxii-clxxv.

253 R.G. Wilkinson, 'Class mortality differentials, income distribution and trends in poverty 1921-1981', *Journal of Social Policy,* Vol. 18 (1989), p. 308.

and to have avoided marsh areas known to suffer from endemic malaria.[254] However, the wealthy were often forced to reside in unhealthy disease environments for economic reasons, such as the merchants operating in London and Truro, and the royal family living in palaces located in London and other unhealthy areas. In fact the trading and other activities of the wealthy which involved travel and contact with a range of different disease environments partly explains the high mortality of the wealthy in the early modern period, although life-style factors were also probably very important.

The data reviewed in this essay provides little support for McKeown's argument that mortality declined first amongst the general population and then later amongst the rich. The reduction of infant and child mortality first took place amongst the aristocracy, gentry, merchant and professional families. This reduced mortality was likely to have been the result of a range of environmental and other improvements initiated by the wealthy from the beginning of the eighteenth century onwards. The role of wealthy families in reducing adult mortality is more ambiguous.

If the arguments of this essay are correct, they support the theory of the 'epidemiologic transition' in which infectious diseases that killed both poor and rich alike were replaced by degenerative illnesses afflicting the poor more than the rich.[255] This transition was associated with the appearance of a social class/mortality gradient in infant and child mortality in the eighteenth century, before which time there seems to have been a minimal correlation between poverty and mortality.

---

254 For evidence of avoidance of the plague by the rich, see S. Porter, *The Great Plague* (Stroud 1999), p. 77. The wealthy not only went to great lengths to avoid smallpox directly, but also frequently only hired servants who had previously had smallpox or had been inoculated or vaccinated. (See Razzell, *Conquest of Smallpox*). Jane Austen wrote in *Sense and Sensibility* of the avoidance of infection at the end of the eighteenth century: "the word infection … gave instant alarm to Mrs Palmer on her baby's account … and confirming Charlotte's fears and caution, urged the necessity of her immediate removal with her infant." J. Austen, *The Complete Novels* (Oxford 1994), p. 186. For the avoidance of unhealthy marsh areas, see Dobson *Contours of Death*, pp. 296-300. For a general discussion of avoidance of disease see J.C. Riley, *The Eighteenth Century Campaign to Avoid Disease* (Basingstoke 1987).

255 A.R. Omran, 'The epidemiological transition theory. A preliminary update', *Journal of Tropical Pediatrics*, Vol. 29 (1983).

In England the reduction of infant and child mortality appears to have taken place in the eighteenth and nineteenth centuries mainly as a result of improvements in sanitary conditions and public hygiene, changes in domestic architecture such as the building of houses in brick and the elimination of earth floors in houses. Other individual measures – such as inoculation and vaccination against smallpox, improved personal hygiene and better breastfeeding practices – also played a role.[256]

Most of the above improvements were the result of a cultural shift in attitude towards better hygiene, cleanliness and more effective medical treatment. Many environmental improvements were the results of local improvement acts, whereas others – such as the drainage of land – were introduced for mainly economic reasons. Contemporaries became increasingly aware of the importance of these measures for the health of both themselves and their children, although some of the improvements resulted from cultural changes in architectural fashion and personal taste.

The various environmental improvements responsible for the reduction of mortality appear to have occurred in a very structured fashion. Jones and Falkus have summarized the improvements that took place in the eighteenth century as follows:

"Brick building and fire resistant styles of architecture, street improvements, fashions for social amenities, and the new institutional form of improvement Act all tended to start out in London … [these influences led to] the transformation of the provincial towns [which] was so extensive that with only slight exaggeration, it might be termed their exit from medievalism. Since provincial towns were numerous, though small by European standards, and because they were so widely scattered about the countryside, they transmitted near-metropolitan models of a way

256 For an extensive discussion of the explanation of the decline in mortality see Razzell *Essays in English Population History*. For discussion of the role of improved personal and environmental hygiene in reducing mortality see R. Haines and R. Shlomowitz, 'Explaining the modern mortality decline: what can we learn from sea voyages?', *Social History of Medicine,* Vol. 11 (1998); S. Guha, 'Nutrition, sanitation, hygiene, and the likelihood of death: the British army in India c. 1870-1920', *Population Studies,* Vol. 47 (1993).

of life and standards of consumption to almost the whole rural population."[257]

This structure of environmental improvements is similar to the history of infant and child mortality: the first changes occurred in London and other large cities, followed by market towns, and then in small provincial rural parishes. These various improvements and the reduction in mortality also appear to have been structured by socio-economic status: first amongst royalty and the urban elite, then by provincial members of the professional middle classes, and finally amongst the general rural population. Certainly it was royalty and the aristocracy living in London who first built brick houses, eliminated earth floors and other unhygienic domestic arrangements, adopted inoculation against smallpox, and introduced a range of other sanitary and medical improvements.[258] Domestic servants also played a role in the cultural transmission of improvements throughout the eighteenth century.[259] Undoubtedly geographical factors were very important, particularly with respect to distance from and contact with London.

Poverty became more important in shaping mortality in the nineteenth century through its association with disease environment. With the development of large cities and industrial areas, social classes became increasingly geographically segregated, leading to an association of poverty with 'the slum'. We hypothesize that before the twentieth century the high mortality found in slum areas was not primarily the result of nutritional poverty, but was mainly due to unhealthy disease environments.

If as we have argued, mortality was not fuelled mainly by poverty but by disease environment, this will affect theoretical assumptions about the relationship between economic and demographic development. The evidence suggests that the reduction of mortality was not brought about mainly by economic

---

257 E.L. Jones and M.E. Falkus, 'Urban improvement and the English economy in the seventeenth and eighteenth centuries', P. Borsay (ed.), *The Eighteenth Century Town: 1688-1820* (London 1990), pp. 145-146.

258 Razzell, *Essays in English Population History.*

259 J. Hecht, *The Domestic Servant Class in Eighteenth Century England* (London 1956).

factors, but was due chiefly to shifts in attitude and knowledge about health and the environment. The resulting changes in mortality and population had a significant impact on economic and social development, a theme which will be explored in detail later in the book.

5. POPULATION, POVERTY AND WEALTH: THE HISTORY OF MORTALITY AND NUPTIALITY IN ENGLAND, 1550-1850.

Introduction.

The relationship between economic development and population growth has long been a matter of controversy.[260] The debate has not only interested demographers but has attracted the attention of economic historians and other social scientists concerned with explaining economic and social change. Much of this debate has been influenced by the assumptions of classical economics, summarised by Adam Smith in his conclusion that "the demand for men, like that for any other commodity, necessarily regulates the production of men; quickens it when it goes on too slowly, and stops it when it advances too fast."[261] His analysis influenced the work of Malthus, Marx, Marshall and others, who all assumed the primacy of economics over demography. Malthus was the most influential of these thinkers, arguing that the main impact of economic factors on population change occurred through the mechanism of nuptiality, with shifts in the standard of living influencing age at first marriage and the propensity to marry.

Much of the argument has focused on England, the country in which the first classical industrial revolution took place. Up until the 1950s, it was the general consensus that population increase in England had occurred mainly as a result of a decline in mortality. Most writers on the subject argued that this reduction in mortality was primarily the result of medical and other non-economic factors, such as smallpox vaccination and an improvement in public and private hygiene.[262] In the 1970s and

---

260 D. Hodgson, 'Orthodoxy and revisionism in American demography'. *Population and Development Review* 14 (1988); J. Simon, *Theory of Population and Economic Growth* (Oxford 1986).

261 A. Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations,* Volume 1 (Oxford 1976), p. 98. Smith emphasized the impact of poverty on mortality. *Ibid*, p. 97.

262 G.T. Griffith, *Population Problems of the Age of Malthus* (Cambridge 1926); M.D. George, *London Life in the Eighteenth Century* (London 1925); J.D. Chambers, 'Three essays on the population and economy of the Midlands', D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography* (London 1965).

1980s the consensus shifted towards a belief that economic factors were primary in shaping population development, mainly through their impact on nuptiality and fertility. The work of E.A. Wrigley and the Cambridge Group was central to this paradigm shift.[263]

According to the findings of the Group's research, population increased rapidly during the sixteenth and early seventeenth century, followed by a period of stagnation in the second half of the seventeenth and first half of the eighteenth century, with rapid growth after the middle of the eighteenth century – a pattern similar to that found by Rickman and others working previously in the field.[264] As we have seen, most of the population changes were interpreted by Wrigley and colleagues as resulting from shifts in nuptiality and fertility due to long-term economic changes, but the evidence reviewed previously in essays 1-4 suggests that exogenous shifts in mortality were the key factors in shaping patterns of population change in the period 1550-1850.

In order to clarify these issues further, additional evidence on changes in nuptiality and mortality will be considered in this essay. No attempt will be made to construct a general demographic model. There is good reason to believe mathematical models when applied uncritically are very misleading. For example, the existing evidence suggests that infant and child mortality rose sharply for most of the eighteenth century in England, at a time when adult mortality was falling significantly. Life table models assume that infant/ child and adult mortality move in the same direction, but in the case of eighteenth century England they appear to have changed in opposite ways. Given these problems, the present essay will focus on new empirical findings and explore their possible theoretical implications.

---

263 E.A. Wrigley and R.S. Schofield, *The Population History of England, 1541-1871* (London 1981).

264 Wrigley and Schofield, *The Population History*; J. Brownlee, 'The history of birth and death rates in England and Wales taken as a whole from 1570 to the present to the present time', *Public Health,* Vol. 34 (1915-16).

The History Of Nuptiality In The Seventeenth, Eighteenth And Nineteenth Centuries.

Some of the most persuasive evidence in favour of the centrality of nuptiality is data on mean age of first marriage. However, as we have seen previously, the accuracy of the findings has been criticized because of the distorting effects of migration.[265] Additionally, there is evidence that those who married in their parish of birth were sociologically and demographically unrepresentative. The marriage licences of West Sussex − covering approximately 150 parishes − contain information on parish of birth of those marrying in the late eighteenth century.

Table 5.1: Proportion Of Brides And Grooms Born In The Parish Of Marriage In West Sussex, By Groom's Occupation, 1775-1800.[266]

Groom's Occupation	*Bachelor Grooms Marrying In Parish Of Birth %*	*Spinster Brides Marrying In Parish Of Birth %*
Gentlemen & Professional	5	29
Yeomen & Farmers	34	34
Artisans & Tradesmen	17	27
Husbandmen	7	13
Labourers & Servants	2	10

Except for gentlemen and professional grooms, occupational groups associated with the ownership of property were much more likely to marry in their parish of birth than those without property. These differences were marked amongst grooms, but even among brides there was a three to one difference in the proportions

265 Ruggles, 'Migration, marriage and mortality'. See also Essay 3.

266 See D. Macleod, (ed.), 'Sussex marriage licences for the Archdeaconary of Chichester, 1775-1800', *Sussex Record Society*, Vol. 35 (1929). The number of bachelor grooms (BG) and spinster brides (SB) in each occupational group are as follows: Gentlemen & Professional: BG: 124, SB: 120; Yeomen & Farmers: BG: 396, SB: 424; Artisans & Tradesmen: BG: 863, SB: 874; Husbandmen: BG: 471, SB: 450; Labourers & Servants: BG: 227, SB: 222.

marrying in the parish of birth. These findings are mirrored in studies of overall geographical mobility. Souden concluded from his research that "the marked lifetime immobility of farmers … contrasted with labourers … would show the degree to which landholding, or its prospect, would condition movement."[267]

There is evidence that there were variations in mean age at marriage by socio-economic group in the eighteenth century. The following table is based on data from Nottinghamshire marriage licences.[268]

Table 5.2: Mean Age Of Marriage (Years) Of Spinsters, By Occupation Of Groom, Nottinghamshire, 1670-1769.[269]

Period	Labourers	Husband -men	Artisans & Tradesmen	Yeomen & Farmers	Professional & Gentlemen
1670-1689	26.1	24.7	25.1	24.2	23.8
1690-1709	25.8	24.4	24.5	24.1	23.9
1710-1729	25.9	25.0	24.7	24.5	24.0
1730-1749	25.6	24.4	24.1	24.4	24.0
1750-1769	25.0	24.4	24.2	23.6	24.7

There were slight falls in mean age at marriage in most groups during the period, but there was also a change in the pattern of marriage amongst the poorest and wealthiest occupational

---

267 D. Souden, *Pre-Industrial English Migration Fields* (University of Cambridge Ph.D. Thesis 1981), pp. 250, 254, 310.

268 For the source of data see T.M. Blagg and F.A. Wadsworth (eds.), *Abstracts of Nottinghamshire Marriage Licences 1577-1700* (British Record Society Index Library, Vol. 58., London 1930); T.M. Blagg and F.A. Wadsworth (eds.), *Abstracts of Nottinghamshire Marriage Licences 1701-53* (British Record Society Index Library, Vol. 60, London 1935); T.M. Blagg (ed.), *Abstracts of the Bonds and Allegations for Nottinghamshire Marriage Licences* (Nottingham: Thoroton Society Record Series, Vol. 10., Nottingham 1946-47).

269 The number of marriages on which these figures are calculated are: Labourers: 1670-89: 208, 1690-1709: 149, 1710-29: 98, 1730-49: 114, 1750-69: 124; Husbandmen: 1670-89: 405, 1690-1709: 342, 1710-29: 796, 1730-49: 526, 1750-69: 103; Artisans & Tradesmen: 1670-89: 728, 1690-1709: 728, 1710-29: 954, 1730-49: 1129, 1750-69: 1092; Yeomen & Farmers: 1670-89: 199, 1690-1709: 185, 1710-29: 132, 1730-49: 422, 1750-69: 733; Professional & Gentlemen: 1670-89: 180, 1690-1709: 206, 1710-29: 255, 1730-49: 189, 1750-69: 186.

categories. In the earliest period 1670-89 the mean age of first marriage amongst labourers' wives was 26.1 years, as against 23.8 years for professionals & gentlemen. This difference had disappeared by 1750-69, with a mean age of 25.0 years for the former and 24.7 years for the latter.[270]

Marriage licence and reconstitution data does not include information on the proportion of women ever married. To create this type of data, and it is necessary to turn to censuses and other sources to analyse this aspect of nuptiality.

A number of local enumeration listings have survived with information on age and marital status, as well as church records with similar information for court witnesses.[271] Although the data from the local enumerations is more reliable than that from church court depositions − including information on the complete population rather than samples of court witnesses − the depositions are not restricted to one individual place but cover a large number of different parishes within a regional district. The following table summarizes the enumeration and church court data, comparing the proportions ever married with that for England & Wales in 1851.[272]

---

270 For further evidence on socio-economic status and age at marriage see Table 9.5, p. 242 and Table 9.7, p. 244. It is possible that the increase in age at marriage amongst professional and gentlemen families was partly the result of declining mortality during this period.

271 The witnesses to church courts came from a wide range of backgrounds and although not a random sample of the general population, they provide a valuable source of information on marriage patterns.

272 The figures for Chilvers Coton, Lichfield and Stoke-on-Trent are taken from P.E. Razzell, *Essays in English Population History* (London 1994), p. 218; the data for 1851 is from B.R. Mitchell and P. Deane, *Abstracts of British Historical Statistics* (Cambridge 1976), p.16. The figures on East Kent depositions are based on an analysis of church court deponents with surnames A-K in the Canterbury Cathedral Archive; the London Diocese figures are derived from information in C. Webb, (ed.), *London Bawdy Courts*, *1703-13* (London 1999), and those for the Winchester Diocese are based on *Winchester Diocese Consistory Cause Papers*, *1700-35* (Manuscript, Society of Genealogists' library). The enumeration figures for Wetherby, Wembworthy, Cardington, Astley, Corfe Castle, and Ardleigh are derived from census schedules lodged in the library of the Cambridge Group. The source of data and the total number of women in each age group is as follows: East Kent, Church Court Depositions: 15-19: 15, 20-24: 60, 25-34: 109, 35-44: 77, 45+: 132. Chilvers Coton, Local Enumeration: 15-19: 52, 20-24: 35, 25-34: 59, 35-44: 48, 45+: 69. Lichfield,

Table 5.3: Proportions Of Women Ever Married In Individual Parishes, 1585-1851.

		Age Group − Proportion Of Females Ever Married				
Place	*Period*	*15-19*	*20-24*	*25-34*	*35-44*	*45+*
		%	%	%	%	%
East Kent	1585-1628	7	42	83	95	100
Chilvers Coton, Warwickshire	1684	9	23	64	90	100
Lichfield, Staffordshire	1695	1	15	72	87	98
Stoke On Trent, Staffordshire	1701	0	17	69	86	91
London	1700-1713	0	37	72	88	98
Hampshire	1700-1730	0	38	77	100	98
Wetherby, Yorkshire	1776	3	41	69	93	86
Wembworthy, Devon	1779	0	13	63	85	100
Cardington, Bedfordshire	1782	3	43	85	93	100
Astley, Warwickshire	1782	0	33	79	100	100
Corfe Castle, Dorsetshire	1790	0	27	62	81	81
Ardleigh, Essex	1796	0	32	75	91	99
England & Wales	1851	0	20	64	84	91

Table 5.3 indicates that there were no linear changes in nuptiality between 1585 and 1851, and there was considerable variation

Local Enumeration: 15-19: 171, 20-24: 147, 25-34: 262, 35-44: 200, 45+: 274. Stoke On Trent, Local Enumeration: 15-19: 69, 20-24: 64, 25-34: 124, 35-44: 100; 45+: 161. London, Church Court Depositions: 15-19: 24; 20-24: 40; 25-34: 89; 35-44: 69; 45+: 66. Hampshire, Church Court Depositions: 15-19: 11; 20-24: 26; 25-34: 26; 35-44: 57; 45+: 51. Wetherby, Local Enumeration: 15-19: 32; 20-24: 27; 25-34: 29; 35-44: 27; 45+: 63. Wembworthy, Local Enumeration: 15-19: 9; 20-24: 8; 25-34: 16; 35-44: 13; 45+: 13. Cardington, Local Enumeration: 15-19: 36; 20-24: 28; 25-34: 43; 35-44: 43: 45+: 72. Astley, Local Enumeration: 15-19: 20; 20-24: 6; 25-34: 14; 35-44: 11; 45+: 17. Corfe Castle, Local Enumeration: 15-19: 54; 20-24: 44; 25-34: 92; 35-44: 62; 45+: 94. Ardleigh, Local Enumeration: 15-19: 64; 20-24: 60; 25-34: 96; 35-44: 44; 45+: 80.

across time and place.[273] Some of this variation is probably a function of sample size and data source, and there is a suggestion in the enumeration data that marriage age may have risen slightly in the eighteenth century, before falling in the nineteenth. This however appears to have been accompanied by a reduction in the proportion of women ever married, a trend consistent with the church court data.

A reduction in the age of marriage and an increase in the proportion of women never marrying may well be linked. During the late seventeenth century about 26 per cent of spinsters in East Kent married widowers, and on average they married 3.8 years later than spinsters marrying bachelors.[274] By the beginning of the nineteenth century, the proportion of spinsters marrying widowers had fallen to 11 per cent,[275] probably reflecting the diminished number of widowers available for marriage due to a reduction in adult mortality. We can hypothesize that many spinsters who had married widowers in the early eighteenth century were unable to find marriage partners in the later part of the century, leading in some areas to a fall in the mean age of marriage but a rise in the number of women never married.

The balance of evidence does not suggest that nuptiality and fertility were the central factors in population change in England during the seventeenth, eighteenth and

---

273 There is some evidence that the propensity to marry among women at the end of the seventeenth century was higher amongst wealthy families than the general population. The combined proportion of women married or widowed in Lichfield and Stoke-on-Trent is as follows amongst elite families (with domestic servants), and non-elite families (without domestic servants). (Number of marriages are in brackets). Elite Families: 15-19: 0% (25), 20-24: 15% (27), 25-34: 69% (62), 35-44: 95% (38), 45+: 99% (74); Non-Elite Families: 15-19: 1% (186), 20-24: 10% (213), 35-34: 58% (288), 35-44: 87% (247), 45+: 93% (348). This data is based on an analysis of transcript of the Lichfield 1695 Marriage Duty listing kindly provided by the Birmingham & Midland Society for Genealogy & Heraldy. For the Stoke-on-Trent 1701 listing see D.A. Gatley (ed.), *The Stoke-upon-Trent Parish Listing, 1701* (Staffordshire Record Society, *Collections for a History of Staffordshire*, Fourth Series, Vol. 16 , 1994).

274 These figures are based on the first 1000 East Kent marriage licences for the period 1661-1676. J.M. Cowper (ed.), *Canterbury Marriage Licences, 1661-76* (Canterbury 1896).

275 This figure is derived from the first 1000 East Kent marriage licences for 1810-37. A.J. Willis (ed.), *Canterbury Marriage Licences, 1810-37* (Chichester 1971).

nineteenth centuries. The next section will examine further evidence for the relationship between socio-economic status and the fall in mortality during the same period.

Socio-Economic Status And Changing Infant And Child Mortality In The Seventeenth, Eighteenth And Nineteenth Centuries.

In order to evaluate McKeown's argument that mortality fell first in the general population and only subsequently amongst the wealthy, it is necessary to control for geographical area. A special analysis of infant and child mortality in the county of Bedfordshire has been carried out, covering all parish registers up to the year 1851.[276] These registers record the families of clergymen, gentlemen, esquires, and members of the aristocracy. The registration of elite families was sufficiently well-defined in parish registers to attract a special tax under the 1695 Marriage Duty Act, and all births of children of gentlemen fathers were taxed a minimum of twenty-two shillings, as against the standard charge of two shillings.[277]

Baptisms to clergymen, gentlemen, esquires and members of the aristocracy were selected from the parish registers, and the next family in the register was chosen as a control.[278] A total of 115 parishes from all parts of Bedfordshire were included in the research, some of these were towns but the majority were small country parishes with a population of less than 500 in

276 Most of these parish registers were published by the Bedfordshire Record Office and all the registers for the county are lodged in the Society of Genealogists' library.

277 D.V. Glass (ed.), *London Inhabitants Within the Walls* (London 1965), p. xi.

278 Only families with information on father's name were selected for study. Of the 731 elite families, 230 were clergymen (31%), 328 gentlemen (45%), 140 esquires (19%) and 33 aristocrats (5%). There was information on the occupation of 280 (38%) of the 731 control families, of which 149 were labourers (53%). More elite families were located in the parish registers during the seventeenth than the eighteenth and nineteenth centuries, and this may have been because information on elite status was more systematically recorded in the earlier period, although there is some evidence that an increasing number of elite families baptised their children in London during the later period.

1801.[279] Same-name inflation ratios were used to correct for burial under-registration; the results of this research are summarized as follows.

Table 5.4: Estimated Infant And Child Mortality (1-4) Rates (Per 1000) Amongst Elite And Control Families In 115 Bedfordshire Parishes, 1600-1849.[280]

Period	*Elite Families*			*Control Families*		
	IMR	CMR	IMR + CMR	IMR	CMR	IMR + CMR
1600-49	98	90	188	144	66	210
1650-99	147	99	246	166	164	330
1700-49	239	53	292	195	139	334
1750-99	136	49	185	245	127	372
1800-49	86	50	136	99	101	200

Combined infant and child mortality increased sharply in Bedfordshire between 1600-49 and 1700-1749, by more than a half amongst both elite and control group families. Mortality was slightly less amongst the elite group in the periods up to the middle of the eighteenth century, but after 1750 mortality grew amongst the control group at a time when it fell amongst the elite population, leading to a significant mortality gradient.[281] Infant and child mortality did not begin to diminish in the control group until the early nineteenth century when it decreased sharply,

[279] All 129 printed transcripts of Bedfordshire parish registers were included in the research, of which 115 had information on elite and control families.

[280] The numbers of baptisms (B) and children at risk (CR), with same-name inflation ratios in brackets are: Elite Families: 1600-49: B: 873, CR: 634 (57/45); 1650-99: B: 854, CR: 625 (57/44); 1700-49: B: 486, CR: 336 (32/27); 1750-99: B: 458, CR: 311 (12/11); 1800-49: B: 464, CR: 302 ((10/8). Control Families: 1600-49: B: 799, CR: 604 (51/28); 1650-99: B: 663, CR: 502 (61/40); 1700-49: B: 558, CR: 423 (78/61); 1750-99: B: 471, CR: 342 (36/24); 1800-49: B: 591, CR: 467 (13/8).

[281] 135 of 168 (80%) elite same-name cases were traced in the burial register, as against 161 of 239 (67%) in the control group, indicating that burial registration was more accurate in the former than in the latter.

somewhat similar to the pattern found in Table 4.12 for the Cambridge Group and nine rural parishes.[282]

Another source of data enabling an analysis of socio-economic status and child mortality is that provided by Boyd. The following table summarizes infant and child mortality rates in London corrected by same-name inflation ratios. The analysis contrasts data for the total sample with that for members of the twelve leading mercantile trading companies,[283] although after 1750 there is insufficient information on wealthy families for a breakdown of this data.[284]

Table 5.5: Estimated Infant And Child (1-4) Mortality (Per 1000) In The City Of London, 1539-1849.

	Total Sample			*Elite Merchants*		
Period	*IMR*	*CMR*	*IMR + CMR*	*IMR*	*CMR*	*IMR +CMR*
1539-1599	155	168	323	121	134	255
1600-1649	238	224	462	222	191	413
1650-1699	256	282	538	261	291	552
1700-1749	409	176	585	422	240	662
1750-1799	263	270	533	–	–	–
1800-1849	141	118	259	–	–	–

282 The pattern of infant and child mortality amongst the control group is similar to that found in Poddington and Elstow in the eighteenth and nineteenth centuries. See Table 3.11, p. 74.

283 B. Weinreb and C. Hibbert, *The London Encyclopedia* (London 1983), pp. 167-177.

284 For the source of this data see footnote 32. For the period 1750-1849 the data was supplemented by volumes 2-8, which included additional information for the parishes of St. Nicholas and St. Lawrence Old Jewry. There are insufficient numbers to use different same-name ratios for the two groups in Table 5.8. The numbers of baptisms (B) and children at risk (CR) are: Total Sample: 1539-99: B: 839, CR: 616; 1600-49: B: 1073, CR: 770; 1650-99: B: 1020, CR: 686; 1700-49: B: 704, CR: 387; 1750-99: B: 720, CR: 435; 1800-49: B: 199, CR: 102. Elite Merchants: 1539-99: B: 485, CR: 404; 1600-49: B: 610, CR: 485; 1650-99: B: 465, CR: 340; 1700-49: B: 194, CR: 131. The same-name inflation ratios are: 1539-99: 48/31, 1600-49: 83/52, 1650-99: 99/67, 1700-49: 68/39, 1750-99: 60/36, 1800-49: 8/4.

Mortality was lower amongst the elite group than in the total sample population during 1539-1649, but this differential was reversed in the period 1650-1749, when mortality was higher amongst elite families.[285] However, the most striking feature of Table 5.8 is the marked increase in infant and child mortality between 1539-1599 and 1700-49 in both groups,[286] similar to the pattern in Bedfordshire. In London, the combined mortality rate more than doubled in elite families, and nearly doubled amongst the total sample population during this period.[287]

The combined infant and child mortality rate in London was 615 per 1000 in 1750-74, 458 per 1000 in 1775-99 and 259/1000 in 1800-49. This scale of fall is similar to that found by Landers amongst London Quakers during the same period,[288] suggesting that there was a general reduction in infant and child mortality in all socio-economic groups at the end of the eighteenth century.

---

285 There is some evidence that wealthy families placed their young infants out to nurse in more healthy parishes during the late sixteenth and early seventeenth century, and this may have been the main reason for their lower mortality during this period. R. Finlay, *Population and Metropolis: the Demography of London, 1580-1650* (Cambridge 1981), p. 94.

286 It should be noted that this increase in mortality occurred in London despite the disappearance of the plague in the 1660s. According to Forbes' study of the parish register of Aldgate – which lists age and cause of death in the period 1583-99 − plague was mainly a disease of adolescents and young adults. T.R. Forbes, *Chronicle from Aldgate* (New Haven 1971). This conclusion is confirmed by the analysis of the parish register of Allhallows London Wall , which also lists age and cause of death for the period 1574-98. Of 121 plague deaths in Allhallows, only 14 − 12 per cent − were under the age of five, and the mean age of death was 19 years. See R. Hovenden, *The Register of Christenings, Marriages and Burials of the Parish of Allhallow London Wall, 1559-1675* (London 1878). The Hollingsworths however argued from a study of age at death in the parish of St. Botolph without Bishopsgate for the year 1603 that children were particularly vulnerable to plague. M.F. Hollingsworth and T.H. Hollingsworth, 'Plague mortality rates by age and sex in the parish of St. Botolph's without Bishopsgate, London, 1603', *Population Studies*, Vol. 25 (1971).

287 The increase in infant and child mortality is similar to that found by Landers amongst London Quakers in the period between 1650 and 1749. J. Landers, 'Mortality and metropolis: the case of London, 1675-1825' *Population Studies* Vol. 41 (1987), p. 64.

288 Landers, 'Mortality and the metropolis', p. 64.

Evidence from the Registrar-General's early reports indicates little or no association between wealth and mortality in London during the mid-nineteenth century. The following table summarizes data on average rateable value of housing and mortality in London's thirty registration districts.[289]

Table 5.6: Infant, Child And Adult Mortality In London By Rateable Value of District, 1838-44.

Registration Districts	*Mean Annual Value Of Rated Property On Each House*	*Infant Mortality Rate Per 1000*	*Child (1-4) Mortality Per 1000*	*Adult (25-44) Male Mortality Per 1000*
10 Districts With Lowest Rateable Value	£15	153	52	13
10 Districts With Medium Rateable Value	£26	168	59	15
10 Districts With Highest Rateable Value	£58	167	58	13

289 See General Register Office, *Fifth Annual Report*, p. 446; General Register Office, *Eighth Annual Report*, pp.192, 193*;* General Register Office, *Ninth Annual Report (Folio Edition)*, pp. 236-238. Infant mortality rates were calculated by expressing deaths in the first year as a proportion of births; child and adult mortality rates were derived by dividing deaths in the appropriate age categories by the population size multiplied by 1000. The districts in the three rateable value groups − in order of value − were as follows: 1. Lowest mean rateable value: Bethnal Green, Camberwell, Shoreditch, Bermondsey, Newington, Stepney, St George Southwark, Greenwich, Rotherhithe, Lambeth. 2. Medium rateable value: Hackney, Whitechapel, St George-in-the-East, Islington, East & West London, Clerkenwell, St Saviour & St Olave, St Luke, Kensington & Chelsea, Holborn. 3. Highest mean rateable value: Poplar, Westminster, Pancras, St Giles, Strand, Marylebone, St James Westminster, City of London, St George Hanover Square.

Districts with the smallest mean rateable values − mainly in the East End of London − had the lowest infant and child mortality rates, as well as one of the lowest adult mortality rates. However, the differences in mortality levels were relatively small, suggesting that there was no significant link between wealth/poverty and mortality in London during this period.[290] Evidence to be reviewed suggests that the wealth of a district was not always reflected in the quality of its public sanitation. For example, in Cheapside, which was one of wealthiest areas of the City of London, there were no drains even as late as 1844, and night soil was still being discharged directly onto the streets.[291]

The Liverpool parish register contains detailed information on father's occupation during the period 1675-1749, allowing the following analysis of infant and child mortality:

290 There is some independent evidence to support this conclusion. Infant mortality amongst Quakers in London in 1825-49 was 150 per 1000, identical to the rate amongst the total population living in equivalent registration districts in 1838-44. Quakers by this period were mainly wealthy merchants and professionals, and the registration districts included in the sample were as follows: Islington, Clerkenwell, Holborn, St. Lukes, City of London, Bermondsey, Rotherhithe, St. Saviours & St. Olaves, St Georges Southwark, Lambeth, Newington, and Camberwell. See Landers, J., 'London mortality in the "long eighteenth century": a family reconstitution study', *Medical History*, Supplement No. 11 (1991), pp. 6-7; General Register Office, *Eighth Annual Report*, pp. 192-93.

291 See p. 171.

Table 5.7: Estimated Infant and Child (1-4) Mortality (Per 1000) Of Merchants & Professionals And The Total Population Of Liverpool, 1675-1749.[292]

Period	*Merchants & Professionals*			*Total Population*		
	IMR	*CMR*	*IMR + CMR*	*IMR*	*CMR*	*IMR + CMR*
1675-1712	201	205	406	202	201	403
1713-1749	172	237	409	192	293	485

There was little or no difference in infant and child mortality amongst merchants & professionals and the general population in 1674-1712. In the following period, 1713-49, mortality increased significantly amongst the general population at a time when it was static amongst the elite group. Most of this increase in mortality in the general population was amongst the 1-4 age group, opening a social class gradient in this age category.

We may summarize the evidence reviewed on the history of socio-economic status and infant and child mortality as follows:

1. Infant and child mortality increased sharply amongst both rich and poor in London from the early seventeenth century, and in Bedfordshire and probably elsewhere, from the middle of the seventeenth century onwards.
2. Levels of infant and child mortality were similar amongst the wealthy and poor in both town and countryside until the end of the seventeenth century.

292 The data is based on all entries in the *Liverpool Parish Register* for the period 1675-1749. The register is lodged in the Society of Genealogists' library. The number of baptisms (B) and children at risk (CR), with same-name inflation ratios in brackets are: Merchants & Professionals: 1675-1712: B: 512, CR: 337 (44/30); 1713-49: B: 456, CR: 219 (35/25); Total Population: 1675-1712: B: 2949, CR: 1915 (227/134); 1713-49: B: 4539, CR: 1954 (354/175).

3. Early mortality began to fall amongst elite families from the middle of the eighteenth century onwards, although in some towns this appears to have occurred at the beginning of the century.
4. Infant and child mortality only reduced amongst the general population during the late eighteenth and early nineteenth century.

Discussion

Two of the most important findings in the above evidence on mortality were the relative lack of an association between socio-economic status and infant and child mortality before the eighteenth century, and a very significant increase in infant and child mortality in London, Bedfordshire and elsewhere during the seventeenth century.

This increase in mortality was probably the result of a growth in disease virulence. Similar increases in infant and child mortality have been found for a number of other urban and rural parishes in England during this period.[293] Dobson has presented evidence for population decline in late seventeenth and early eighteenth century south-east England, suggesting that it was the

[293] There is information on twelve Cambridge Group parishes for the period after 1550, showing a modest growth in infant mortality but a significant increase in child mortality − of about 55 per cent − between 1550-99 and 1700-49. Wrigley and Schofield, *The Population History*, p. 249. More recent figures covering a larger group of parishes for the period 1580-1849 indicate higher levels of infant and child mortality, but with similar proportionate increases between the late sixteenth and middle of the eighteenth century. Wrigley *et.al.*, *English Population History*, pp. 226, 251. Equivalent increases in mortality occurred in York and London during the same period. C. Galley, *The Demography of Early Modern Towns: York in the Sixteenth and Seventeenth Centuries* (Liverpool, 1998), pp. 92-93. However none of this data has been corrected for burial under-registration. The evidence on adult mortality suggests no significant change in mortality in the seventeenth century. See Essay 3 of the present volume.

result of the '*unification microbienne du monde*',[294] with the introduction of a range of new diseases, including malaria.[295]

There is a consensus that incomes improved significantly during the period 1600-1749, with real wages growing by approximately 50 per cent.[296] The increase in infant and child mortality during this period of growing real incomes suggests that the nutritional standard of living did not play a significant part in shaping mortality patterns.[297]

Diseases like smallpox are known to have increased significantly in virulence from the sixteenth century to the late nineteenth century.[298] Other infections – in particular diseases classified by contemporaries as "fever" – also increased significantly during the seventeenth century.[299] Typhus was probably introduced into England from the Continent during the middle of the sixteenth century.[300] It affected rich and poor alike and became widespread in both town and countryside during the seventeenth century.[301] However, typhus was much more fatal to

---

294 E. Le Roy Ladurie, 'Un concept de l'unification microbienne du monde xive-xviie siecles', *Le Territoire de L'historien* (Paris 1978).

295 M. Dobson, 'The last hiccup of the old demographic regime: population stagnation and decline in late seventeenth and early eighteenth-century south-east England', *Continuity and Change*, Vol. 4 (1989).

296 Wrigley and Schofield, *The Population History*, pp. 408, 642-643.

297 For a general discussion of economic development and mortality in the early modern period, see J. Hatcher, 'Understanding the population history of England 1450-1750', *Past and Present,* Vol. 180 (2003).

298 Razzell, *The Conquest of Smallpox*, pp. 166-180.

299 Fever and ague account for about 6 per cent of all deaths in Aldgate during 1583-99, most deaths occurring amongst adolescents and adults. See Forbes, *Chronicle from Aldgate.* See also *Allhallows in the Wall Burial Register* for a similar level of fever deaths. According to the London Bills of Mortality, about 15 per cent of all deaths were due to fever in the first half of the eighteenth century, again most of them taking place amongst adults. Vann & Eversley, *Friends in Life and Death*, pp., 212-215, 234. Fever appears prominently in some Bedfordshire burial registers after the end of the seventeenth century. See the *Riseley Parish Register*, p. Bi, and *The Milton Ernest Parish Register*, p. xi, in the Society of Genealogists' library.

300 H. Zinsser, *Rats, Lice and History* (New York, 1963), p. 279.

301 C. Creighton, *A History of Epidemics in Britian,* Vol. 2 (Cambridge 1965), pp. 30-33. The environmental conditions favourable to the spread of typhus appear to have been present in England well before the sixteenth century. Body lice continued to be prevalent in both town and countryside well into the

adults than children,[302] and it was probably more the virulent strains of smallpox, and other childhood diseases, imported into England with the growth of world trade that led to the increase in infant and child mortality in the seventeenth century.[303]

There were a number of changes in domestic hygiene that were possibly linked to the reduction of mortality in the early eighteenth century: the building of houses in brick, the elimination of earth floors, and the more effective washing of furniture and clothes.[304] However, most of these changes were probably first adopted by elite families, and the lack of an overall association between socio-economic status and falling adult mortality raises questions about the exact role of these improvements in the reduction of mortality.

There was a fall in the number of 'fever' deaths amongst adults in London during the eighteenth century,[305] and much of this reduction in mortality was probably linked to the gradual elimination of typhus infection.[306] Woollen underwear was replaced by linen and cotton garments during this period, and more effective washing − involving the boiling of clothing − was

---

eighteenth and nineteenth centuries. The prevalence of body lice is illustrated by entries in the Riseley parish register: four deaths are listed in the period 1690-1742 as a result of 'eaten up of lice'. See *The Riseley Parish Register,* p.Bi.

302 A.J. Saah, 'Rickettsia prowazekii (epidemic louse-borne typhus', G.L. Mandell, J.E. Bennett and R. Dolin (eds.), *Principles and Practice of Infectious Diseases*, Vol. 2 (Philidelphia 2000), p. 2051; Creighton, *A History*, Vol. 2, p. 47. Typhus probably replaced plague as the main cause of death of adults in London and elsewhere, perhaps explaining why there was not a more general decrease in adult mortality after the 1660s.

303 Dobson, 'The last hiccup', p. 421; M. Livi Bacci, *The Population of Europe* (Oxford 2000), p. 63. For the role of world trade in spreading smallpox and yellow fever see M.B.A. Oldstone, *Viruses, Plagues and History* (Oxford 1998), pp. 4, 30, 45, 46.

304 De Saussure wrote in the late 1720s: "The amount of water English people employ is inconceivable, especially for the cleansing of their houses … Not a week passes by but well-kept houses are washed twice in the seven days, and that from top to bottom; and every morning most kitchens, staircase, and the entrance are scrubbed. All furniture, and especially all kitchen utensils, are kept with the greatest cleanliness." C. De Saussure, *A Foreign View of England in 1725-29* (London 1995).

305 Vann and Eversley, *Friends in Life and Death*, p. 234.

306 Creighton, *A History*, Vol. 2, p. 14.

probably responsible for the progressive elimination of both body lice and typhus.[307]

However, the decline of infant and child mortality in London appears to have been linked to general environmental changes associated with improvement acts introduced from the 1740s onwards.[308] There were few socio-economic variations in London's mortality in the whole period 1550-1849, suggesting that overall disease environment was more significant in this highly urbanized area than individual differences.

Other measures important for the reduction of infant and child mortality − such as better breastfeeding practices, inoculation/ vaccination against smallpox, and improved personal hygiene − were introduced at a later date.[309] During the period of rapidly decreasing infant and child mortality in the countryside − 1801-41 − per capita consumption of soap nearly doubled: from 5.3 pounds in 1801 to 9.9 pounds in 1841.[310] There is evidence that personal hygiene played a significant role in improving health and reducing mortality during the nineteenth century.[311]

---

307 Gilbert White noted in 1778: "The use of linen changes, shirts or shifts, in the room of sordid and filthy woollen clothing, long worn next to the skin, is a matter of neatness comparatively modern; but must prove a great means of preventing cutaneous ails." Forty-four years later, Francis Place concluded that "the success of the cotton manufactures' had enabled the working classes to 'discard the woollen clothes which were universally worn by them, which lasted for years, and were seldom, if ever washed." See Razzell, *Essays in English Population History*, p. 223.

308 R. Porter, 'Cleaning up the Great Wen: public health in eighteenth century London', W.F. Bynum and R. Porter (eds.), *Living and Dying in London* (*Medical History,* Supplement No. 11, London 1991).

309 Razzell, *Essays in English Population History*, pp. 224-229; Razzell, *The Conquest of Smallpox*.

310 B.R. Mitchell and P. Deane, *Abstracts of British Historical Statistics* (Cambridge 1976), pp. 8, 265.

311 R. Haines and R. Shlomowitz, 'Explaining the modern mortality decline: what can we learn from sea voyages?, *Social History of Medicine,* Vol. 11 (1998); S. Guha, 'Nutrition, sanitation, hygiene, and the likelihood of death: the British army in India c. 1870-1920', *Population* Studies, Vol. 47 (1993). For a detailed discussion of the impact of improved sanitation and hygiene on childhood mortality from diarrhoea see S.E. Burger and A.A. Esrey., 'Water and sanitation: health and nutrition benefits to children', P. Pinstrup-Anderson, D. Pelletier and H. Alderman (eds.), *Child Growth and Nutrition in Developing Countries* (Ithaca 1995).

Although most of these measures were not the result of economic developments, clearly economic change did have an indirect influence on mortality. For example, agricultural improvements led to the drainage of marshland which probably contributed to the elimination of malaria, and the production of cheap cotton cloth enabled working class families to improve their standard of personal hygiene. There was also an economic element in some of the other factors responsible for mortality decline: for example the rebuilding of houses and house floors in brick and stone. However, elite social groups had always had the economic resources necessary for these improvements, and the majority of changes probably resulted from new attitudes towards disease, personal hygiene and the environment.[312] These changes in attitude and belief appear to have first influenced the educated and wealthy, and gradually spread to the general population later in the eighteenth and nineteenth centuries.

Conclusion

The evidence reviewed suggests that the structure of population change in the long period between the sixteenth and nineteenth centuries is similar to the pattern of changing mortality during the same period. Population grew rapidly during the sixteenth century when early mortality was low, it stagnated after the middle of the seventeenth century as infant and child mortality increased, and resumed rapid growth during the eighteenth century as overall mortality diminished.[313]

Population increase came to a halt in a number of European countries at the beginning of the seventeenth century and only resumed during the eighteenth.[314] For example,

---

312 This shift in attitudes was partly associated with the eighteenth century enlightenment movement. The Royal Society's statistical investigation in the 1720s into the effectiveness of inoculation − comparing natural smallpox mortality with that amongst the inoculated − is perhaps the first historical example of a scientific assessment of a medical treatment. Razzell *Conquest of Smallpox*, pp. 172-74.

313 For different estimates on long-term changes in population levels see Wrigley and Schofield, *The Population History*, pp. 575, 577.

314 Livi Bacci, *The Population*, p. 8.

population had increased rapidly in Holland in the sixteenth and early seventeenth centuries in spite of half its population living in urban areas, but this growth came to an end in the middle of the seventeenth century and only resumed at the end of the eighteenth century.[315] This stationary population was probably the result of increasing disease virulence, particularly affecting the trading towns of Holland.[316] The Dutch economy stagnated during the eighteenth century[317] and on the argument of the present essay this lack of economic growth was largely a function of its static population.

Fertility appears to have played little or no role in population change in England during the eighteenth century, and most of the demographic developments were probably the result of changes in disease environment. Demographic transition theory tends to assume that both fertility and mortality were high before the period of transition, whereas the English evidence indicates a cyclical pattern in long-term mortality levels. Theories of demographic transition have also tended to emphasize the central role of economic forces in population change, but in England during the seventeenth, eighteenth and early nineteenth centuries, the evidence reviewed indicates that reductions in mortality and increases in population were not primarily shaped by levels of economic development.

---

315 A.M. Van Der Woude, 'Population developments in the northern Netherlands (1500-1800) and the validity of the "urban graveyard" effect', *Annales De Demographie* (1982).

316 Livi Bacci, *The Population*, p. 63.

317 J. De Vries and A.M. Woude, *The First Modern Economy: Success, Failure and Perseverance of the Dutch Economy, 1500-1815* (Cambridge 1997).

III

Causal Factors In Mortality Decline

6. THE ROLE OF PERSONAL, DOMESTIC AND PUBLIC HYGIENE IN SHAPING ENGLISH MORTALITY PATTERNS, 1500-1899.

Introduction

Essays 3-5 suggest that there was little or no correlation between wealth and levels of infant and child mortality before the eighteenth century, and that the first reductions in these forms of mortality took place amongst royalty, the aristocracy and other members of the wealthy elite. The falls in infant and child mortality amongst the general population took place during the late eighteenth century and early nineteenth century. These reductions in mortality appear to have occurred first in cities and towns starting in the middle of the eighteenth century, and later in rural areas at the end of the eighteenth and beginning of the nineteenth century.[318]

The reasons for the exceptionally high mortality amongst royal children before 1700 must be largely speculative given the absence of serious scholarship on the medical history of the royal family, and the hygiene and sanitary conditions in palaces and royal residences during the early modern period. It is possible that the high levels of infant and child mortality in the pre-1700 period may have been a result of genetic factors. Also, there is evidence that venereal disease may have been a factor in the high infant and child mortality amongst the royalty.[319] However, the children of monarchs known to have had many illegitimate children − and therefore more likely to have suffered from venereal disease − only had a slightly higher rate of mortality than those born to monarchs without illegitimate children.[320] Also, the number of children born to each Queen was smaller in the earlier period than

---

318 See Essays 2-5.

319 For example, Pepys claimed that the Duke of York had given his wife venereal disease with the result that 'all her children are thus sickly and infirm.' R. Latham and W. Matthews (eds.), The *Diary of Samuel Pepys*, Vol. 9, (London 1995), p. 154.

320 The proportion dying under five was 54.6% (12 out of 22) among children born to monarchs without illegitimate children, and 68.6% (24 out of 35) to those with illegitimate children. These figures are derived from Weir, *Britain's Royal Families*.

the later one,[321] and as high fertility is known to be generally associated with high infant mortality,[322] this suggests that the large number of children dying in the pre-1700 period was not the result of purely biological factors.

Recently Johansson has argued that doctors played a central role in the reduction of mortality in elite families during the early modern period.[323] She has listed the following medical innovations and practices which might have affected the health of the wealthy and reduced their mortality: i. cinchona bark for the treatment of malaria; ii. the employment of lithotomy and new surgical techniques for cutting the stone; iii. digitalis extracted from foxglove for the treatment of gout and dropsy; iv. inoculation against smallpox; v. the use of colostrum and other improvements in infant feeding; vi. advice on hygiene and cleanliness to improve personal health; vii. medical influence on improvements of public health.[324] Most of these medical improvements have been extensively discussed in the literature,[325] but the role of doctors was probably more ambiguous than claimed by Johansson. For example, physicians greatly complicated the practice of smallpox inoculation, by introducing a period of preparation for purging and bleeding patients, a period in which patients were vulnerable to natural infection.

The role of personal, domestic and public hygiene in the mortality decline has however been relatively neglected in the literature and I will focus on this topic in the following discussion.

---

321 The average number of live born children in 1500-1699 was 4.9 children, as against 7.3 children in 1700-1899.

322 See E. Garrett and A. Reid, 'Thinking of England and Taking Care: Family Building Strategies and Infant Mortality in England & Wales, 1891-1911,' *International Journal of Population Geography*, Vol. 1 (1995), for a discussion of the evidence for the association between high fertility and infant mortality.

323 Johansson, *Death and the Doctors.*

324 *Ibid*, pp. 36-46.

325 See M.D. George*, London Life in the Eighteenth Century* (London 1925)*;* G.T. Griffith*, Population Problems in the Age of Malthus* (Cambridge 1926); M.C. Buer*, Health*, *Wealth and Population* (London 1926); Razzell, *Essays in English Population History*. For the role of doctors in lowering infant and maternal mortality see A. Armstrong, *The Population of Victorian and Edwardian Norfolk* (Norwich 2000*)*, p. 63.

Sanitary Conditions And The Disease Environments Of Royal Palaces

The paradox of high mortality amongst the royal family is made even greater by what is known about the sanitary arrangements made by royalty from the early sixteenth century onwards. Henry VIII introduced extensive water supplies into most of the major royal palaces, including elaborate conduit and lead-pipe systems.[326] Bathrooms were built with running hot water in some of the palaces as a part of these improvements,[327] and Queen Elizabeth is known to have owned "a portable bath that she took with her from palace to palace."[328] Arrangements were made to discharge waste and sewerage from royal palaces into nearby rivers:

"The importance of keeping moats clean meant that all sewers and drains from the moated platform of a house had to run either over or under the moat and away from the house. The drains at Hampton Court for instance started in sumps in the floor of the kitchens, ran down the centre of the kitchen court picking up waste from the subsidiary buildings, and then out of the moat. After running across the forecourt they collected more waste from outbuildings before emptying in the river."[329]

The practice of hygiene however did not reflect these known sanitary arrangements. In King Henry's case

"it is known on medical advice the King took medicinal herbal baths each winter, and also avoided baths when the sweating sickness was about. This avoidance possibly reflected a school of thought that rated bathing as a dangerous activity which 'allowed the venomous airs to enter and destroyeth the lively spirits in man and enfeebleth the body.'"[330]

---

326 S. Thurley, *The Royal Palaces of Tudor England* (Yale 1993), pp. 163-167.

327 *Ibid*, pp. 167-171.

328 A. Weir, *Elizabeth the Queen* (London 1998), p. 235.

329 Thurley, *The Royal Palaces*, pp. 172, 173.

330 *Ibid*, p. 171.

Henry VIII's practice of bathing was similar to that of his daughter Elizabeth, who used her portable bath "twice a year for medicinal purposes."[331] The problem was much more radical than could be addressed by individual royal action: as one social historian has written "the palace buildings themselves were always danger spots … [resulting from] primitive sanitation, inadequate scavenging and almost total ignorance of other elementary facts about public health bred disease."[332] There were large congregations of people attending court, and "in the heyday of Whitehall Palace it was not unusual for the Steward to provide 1,500 people with dinner on a single day."[333] The crowds included "hordes of beggars, prostitutes and pickpockets that lived on their wits right on the king's doorstep."[334]

In the earlier period, many of the royal residences had earth floors which were associated with highly unsanitary conditions: "The floors of the royal apartments [of Westminster Palace] in 1500 were still being strewn with rushes and sweet herbs that were changed daily, like sawdust in a butcher's shop … Dogs and beggars roamed the courtyards living on the scraps that fell from the royal table … It was not surprising that crowned heads and courtiers carried posies as they walked about the palace precincts to counteract the offensive smells and help ward off infection."[335]

Erasmus gave his well-known description of English buildings in 1517, which may have included some of the royal palaces that he visited: "the floors are generally spread with clay and rushes from some marsh, which are renewed from time to time but so as to leave a basic layer, sometimes for twenty years, under which fester spittle, vomit, dogs' urine and men's too, dregs of beer and cast-off bits of fish, and other unspeakable kinds of filth."[336] Two foreign visitors, Paul Hentzner and Thomas Platter,

---

331 Weir, *Elizabeth the Queen*, p. 235. See also L.G. Matthews, *The Royal Apothecaries* (London 1967), p.73.

332 N. Williams, *The Royal Residences of Great Britain: a Social History* (London 1960), p. 2.

333 *Ibid*, p. 7.

334 *Ibid*, p. 6

335 *Ibid*, p. 18.

336 Quoted in Razzell, *Essays in English Population History*, p. 24.

noted in 1598 and 1599 that the floors of the palaces at Greenwich, Nonsuch and Hampton Court were still strewn with rushes and hay.[337]

A recent biography of Queen Elizabeth noted how at court in the Great Hall, the "ladies of the Privy Chamber were so encumbered by their farthingales that there was no room for them all on the benches and they were obliged to eat 'on the ground on the rushes', the floors being strewn with herbs and grasses in order to scent the air and cover up the dirt."[338] The dangers to health of such flooring was pointed out by Andrew Boorde, and referring to sleeping sickness, he described how he had known "when the straw and rushes hath been cast out of a house infected, the hogs the which did lie in it, died of the pestilence …"[339] This is plausible, given that sweating sickness was probably a form of influenza, known to infect both pigs and humans.

The Eltham Ordinances issued by Wolsey in 1524 also revealed the poor sanitary conditions of the kitchens in royal palaces. Under the heading of "Scolyons, And Keeping Cleane Of The Courts", the ordinances stated that

"for the better avoyding of corruption and all uncleanesse out of the King's house, which doth ingender danger of infection … it is ordeyned, by the King's Highnesse, that the three master cookes of the kitchen shall have everie of them by way of reward twenty marks, to the intent they shall provide and suffiently furnish the said kitchens of such scoloyns as shall goe naked or in garments of such vilenesse as they now doe, and have been accutomed to doe, nor lie in the nights and dayes in the kitchens or ground by the fire-side; but that they of the said money may be found with honest and whole course garments, without such uncleannesse as may be the annoyance of those by whom they shall passe …"[340]

The hygienic state of the food prepared in such conditions must have had a major impact on the health of members of the royal

---

337 Razzell, *Essays in English Population History*, pp. 224, 225.

338 Weir, *Elizabeth the Queen*, p. 252.

339 H.E. Poole, *The Wisdom of Andrew Boorde* (Leicester 1936), p. 52.

340 *A Collection of Ordinances and Regulations for the Government of the Royal Household* (Society of Antiquaries, London 1790), p. 148.

family forced to consume it. The Eltham Ordinances also revealed the squalid state of the court itself, including the area immediately outside the King and Queen's chambers:

" … the yeoman wayters, upon their wayting day, avoyde and purge the haute-pace at the King's chamber-doore, of all manner servants, raskalls, boyes and others, soe as the same place be not pestered with any great number of persons, but as the King may have a large passage to the Queen's chamber; and that they see the same haute-pace to be clean kept, soe that noe ale, water, broken meate, or other thing conveyed out of the King's chamber, be cast or remaine there, to the annoyance and filthynesse of the same."[341]

The attempted reforms of the court failed, and in 1547 the Privy Council had to issue a proclamation that "no person of what degree soever shall make water or cast any annoyance within the precinct of the court."[342] At "Greenwich it was found necessary to paint red crosses on the walls of the inner courtyard so that 'none should pysse ayenst them'," particularly outside the king and queen's chambers.[343]

In some palaces the sewerage and other waste products were discharged into surrounding moats, "and a feeling letter among the State papers vividly recalls the unpleasantness involved in cleaning out a 'marvellous fowll and fylthy' moat at one of the royal palaces."[344] Like the City of London, royal palaces were usually bounded by polluted and stagnant water, and were inhabited by dense populations during the period of court residence, ideal conditions for the breeding of mosquitoes, disease and infection. The practice of emptying waste into moats was sufficiently common for Andrew Boorde to caution against letting "the filth of the kitchen descend into the moat."[345]

---

341 *A Collection of Ordinances and Regulations for the Government of the Royal Household* (Society of Antiquaries, London 1790), p.153.

342 P.L. Hughes and J. Larkin, *Tudor Royal Proclamations, Volume 1, 1485-1553* (London 1964), p. 405.

343 H.M. Colvin (ed.), *The History of the Kings Works*, Vol. 4 (London 1982), p. 27.

344 *Ibid*, p. 28.

345 Poole, *The Wisdom of Andrew Boorde*, p. 25.

The internal sanitary arrangements of some of the palaces and houses of the rich were revealed by Sir John Harrington in 1596:

"… there be few great & well contrived houses, but have vaults and secret passages under ground, to convey away both the ordure & other noisome things, as also the raine water … with the fishwater coming from the kitchen, bloud and garbage of fowle, washing of dishes, and the excrements of the other houses joyned together, and all these in moyst weather stirred a little with some small stream of rain water … these thus meeting together, makes such a quintessence of a stinke, that if Paracelsus were alive, his art could not devise a stronger."[346]

However, it was not just the sanitary and hygienic conditions inside the palaces which were responsible for the very high mortality amongst the royal family. It was the large congregation of people who attended and visited the court, at all times of the year. This was recognised by the Court itself, one royal proclamation referring to the "perill oftentimes ensueth by the meanes of great assemblies of people in the time of infectious diseases."[347] Many of these came from London and other cities and towns known to be reservoirs of disease and infection, and frequent royal proclamations were issued throughout the whole of the Tudor and Stuart period attempting to prevent people attending court during periods of plague or other epidemic diseases.[348] However, it was impossible to prevent large numbers of people attending court for economic and other reasons. During Charles II's reign, a proclamation was published commanding

346 J. Harrington, *A New Discourse of a Stale Subject, Called the Metamorphosis of Ajax* (ed. E.S. Donne, London 1962), pp. 160, 161.

347 J.F. Larkin and P.L. Hughes (eds.), *Stuart Royal Proclamations, 1: Royal Proclamations of King James I, 1603-25* (Oxford 1973*)*, p. 151.

348 See Hughes and Larkin, *Tudor Royal Proclamations*, Vol. 1, pp. 234, 235, 259, 260, 319, 320, 408; Vol. 2, pp. 318, 319, 320, 321, 322, 345, 346; Larkin and Hughes, *Stuart Royal Proclamations*, pp. 151, 152, 175, 176; J.F. Larkin (ed.), *Stuart Royal Proclamations,* Vol. 2 *: Royal Proclamations of King Charles I, 1626-46* (Oxford 1983*)*, pp. 64, 65.

"Our officers, and namely Our Knight Marshall not to suffer about or nere Our standing houses, and houses, tents, boothes, or places, to be employed for tipling-houses, selling or takeing tobacco, hott waters, or any kind of disorder, which besides the annoyance, live upon Our House and corrupt the meaner sort. The said Marshall shall cause his men to waite daily to punish and remove vagrant persons, rogues, and all sorts of beggars, idle and loose people…"[349]

Royal Palaces were also places of legal privilege, whereby bankrupts were exempt from legal process so that they became "nothing but Dens of Thieves and Bankrupts … a sacred Asylum to receive them."[350] They were also centres of healing, so that large numbers of the sick and diseased flocked to them to seek a cure. The Court struggled to regulate such practices, but without success. The royal physician "ought to espie, if any of this courte be infected with leperiz or pestylence, and to warne the soveraynes of hym, till he be purged clene, to keepe hym oute of courte. There ought no perilous syke-man to lodge in this courte …"[351]

Part of the problem was that the sovereigns themselves accepted their duty to cure diseases like scrofula (the King's Evil), believed to be curable by the sovereign's touch. The practice had been revived by Queen Elizabeth, and "at Whitehall and on progress, Elizabeth would regularly 'press the sores and ulcers' of the afflicted 'boldly and without disgust'"[352] King Charles I was particularly concerned to regulate the practice and issued a series of proclamations between 1629 and 1632 attempting to control the times people could approach him at the Court for the purposes of cure.[353] His son, Charles II seems to have been more relaxed about touching for the King's Evil, and touched nearly 1,700 people in the first two months after his restoration,[354] attempting to heal not

349 *A Collection of Ordinances and Regulations*, p. 352.

350 M. Misson, *Memoirs and Observations in His Travels over England* (London 1719) p. 224.

351 *A Collection of Ordinances and Regulations* p. 43.

352 Weir, *Elizabeth the Queen*, pp. 58, 226.

353 Larkin, *Stuart Royal Proclamations*, pp. 238, 239, 330, 331, 332, 349.

354 L. Picard, *Restoration London* (London 1997), p. 79.

only people suffering from scrofula, but also people displaying "other miscellaneous symptoms".[355] The last monarch to touch for the King's Evil was Queen Anne, who last performed the ritual on the 27th April 1714, three months before she died.[356]

Royalty was however concerned about protecting its young infants against the dangers of infection. For example, King Henry VIII issued in 1537 the following proclamation with reference to the baptism of his son Edward:

"His highness, being credibly informed that there is and hath been great infection of the plague within the city of London and the suburbs of the same, doubting that a great multitude of his loving subjects being joyous (as they have cause) of the birth of the said noble prince would make their access to his grace's court, whereby peril might ensue; doth therefore straightly charge … all … his subjects … shall [not] repair of resort unto his said grace's court …"[357]

King Charles issued a proclamation in 1630 in which he announced the removal of the christening of Prince Charles into the country, on account of "the present danger of the pestilence so fearfully dispersed in severall parts of this our Citty of London."[358] It is perhaps for this reason, that the royal children were often sent to live in country houses outside London at Hanworth, Ditton, Beaulieu, Hertford, Woodstock, Ampthill, Enfield, Guildford, Working, Otford, Westenhanger, Hunsdon, Tyttenhanger, Hatfield and Ashridge.[359] We know little about the conditions in these houses, except that most of them appear to have had no running water and suffered from the most primitive sanitary conditions.[360] In any event, most of the royal children had apartments in the

---

355 Picard, *Restoration London*, p. 80.

356 M. Bloch, *The Royal Touch* (London 1972), p. 220. The Whigs played a central part in these cultural changes, as well as with medical innovations such as inoculation against smallpox. See A. Wilson, 'The politics of medical improvement in early Hanoverian London', A. Cunningham and R. French (eds.), *The Medical Enlightenment of the Eighteenth Century* (Cambridge 1991).

357 Hughes and Larkin, *Tudor Royal Proclamations*, pp. 259, 260.

358 Larkin, *Stuart Royal Proclamations*, p. 273.

359 Thurley, *The Royal Palaces of Tudor England*, pp. 78, 79, 80.

360 *Ibid*, p. 163.

major palaces in London,[361] and spent at least some time living with their parents, which would have made them very vulnerable to the diseases of the Court described above.

The dangers of royal children receiving infection from crowds of courtiers and others began virtually from the day of their birth. King Henry VII issued a series of ordinances that give us a glimpse of the way royal children were treated:

"To ordayne for christening of a Prince … the font to bee sett on a great height, that the people may see the christening, and presse not too nighe … there must bee borne before the child two hundred torches; twenty-four borne by esquires about the child, and the other borne before by yeomen … Earles, Barons, Banneretts … to beare … the child to the Queen's chamber doore … then the child to bee had into the nursery, where it shall bee nourished with a Ladie governour to the nursery nurse, with four chamberers, called rockers; and the chamberlaine … to see the nurses meate and drinke bee ever asayed while she giveth the child sucke; and a phisition to stand over every meale, and see what meate or drinke shee give the child."[362]

The latter part of this quote indicates the nature of the feeding of infant royal children, a mix of breastfeeding and the use of solids, including 'meate or drinke', virtually from the first day after birth. Given the very poor state of hygiene in kitchens and elsewhere in the royal palaces, the feeding of young infants with solids and artificially prepared drink must have been highly dangerous. Valerie Fildes has presented evidence to show that the benefit of colostrum available from the mother in the first three or four days was generally with-held from children on the grounds that it was thought harmful, and that it was only during the eighteenth century that the medical benefits of colostrum were realised.[363]

---

361 Thurley, *The Royal Palaces of Tudor England* pp. 78, 79, 80.

362 *A Collection of Ordinances and Regulations*, pp. 126, 127.

363 V. Fildes, *Breasts, Bottles and Babies* (London 1986), pp. 81, 83, 91.

A Case Study Of Sanitary Conditions: The Diaries Of Samuel Pepys.

The diaries of Samuel Pepys provide very detailed information on personal and domestic hygiene, allowing us to explore in greater detail their possible impact on mortality levels. In order to understand the environment in which Pepys lived, it is necessary to summarise the sanitary condition of the City of London and Westminster during the seventeenth century. Before the great fire of 1666 most houses were timber-framed, and the streets were composed of irregular-shaped cobbles including a central kennel for surface drainage. Although piped water had been laid on in some houses in the City of London and elsewhere, there was virtually no internal plumbing and many houses were reliant on wells and pumps for their water supply. Some houses had cesspits built outside the house in gardens and yards, but most houses appeared to have had open vaults in basements in which all waste matter − kitchen waste, excreta, urine, rain water − was deposited.

The waste vaults were usually connected to the "houses of office" (latrines) and kitchen sinks by internal waste ducts and pipes, often made of timber, and sometimes built at an angle to accommodate latrines on the upper floors. Most households at this time used chamber pots emptied into the vaults via the "houses of office" on different floors, although very often the main latrine appears to have been located next to the kitchen,[364] presumably to allow more convenient disposal of all waste material. In the absence of water closets, most excreta and urine was deposited in the vaults through gravity, and the conditions of some of the wooden ducts particularly in hot weather must have been highly unhygienic. These internal areas of the house − with their deposits of kitchen waste and human manure − must have been ideal breeding grounds for rats, fleas, lice and other parasitic organisms, which as we will see later, afflicted Pepys, his domestic household and his social circle.

These vaults were usually emptied by night-soil men who would enter the house after nine o'clock in the evening, using the night-time to empty the contents of the vault. Sometimes the waste matter was pumped into the open street, as happened in the

364 See J. Schofield, *The London Surveys of Ralph Tresswell* (London 1987), pp. 22-24.

following example. In the 1670s, Lord Guildford bought a house in Chancery Lane in London:

"There he found a 'small well in the cellar, into which all the drainage of the house was received', from closet and sink alike. When this was full a pump went to work to clear it into the open kennel (gutter) of the street. As may be imagined 'during the pumping the stench was intolerable', offending not only his lordship, but all the houses in the street . . . Nor was his the only house to create such a nuisance, for 'other houses there, which had any cellars, were obnoxious to the same inconveniences.' Guildford proposed that the inhabitants should join in making a drain along the street deep enough to discharge into the new sewer under Fleet Street, but they refused, 'alledging danger to their houses and other frivolous matters.'" [365]

This practice of depositing manure and other waste products into the street had a long history in London, partly due to many smaller houses not having privies built into them. The statutes regulating the streets of London and still in operation in 1720, included the following:

"No Man shall cast any Urine-Boles, or Ordure-Boles into the Streets by Day or Night, afore the Hour of nine in the Night; And also he shall not cast it out, but bring it down, and lay it in the Canel, under pain of three Shillings and four pence. And if he do cast it upon any Persons Head, the Person to have a lawful Recompence, if he have hurt thereby."[366]

The reader will note that it was only if the passer-by was damaged by the deposit of the urine and ordure boles on his head that he had any legal redress.

The above brief discussion of sanitary conditions in London during the seventeenth century is sufficient to provide the background for discussion of the detailed evidence provided by Pepys's diary. Pepys lived in Seething Lane in the City of London,

---

365 T.F. Reddaway, *The Rebuilding of London* (London 1940), p. 287.

366 J. Stow, *A Survey of the Cities of London and Westminster*, (ed., J. Strype, London 1720), Book 2, p. 307.

near to the Tower of London and next to other officials at the Navy Office. His main water supply was from a pump located in a yard shared with his neighbours,[367] and his waste was discharged into a vault located in his cellar, which he also shared with his neighbours. In the first year of the diary, the following event occurred:

"This morning one came to me to advise with me where to make me a window into my cellar in lieu of one that Sir W. Batten has stopped up; and going down into my cellar to look, I put my foot into a great heap of turds, by which I find that Mr Turner's house of office is full and comes into my cellar, which doth trouble me; but I will have it helped."[368]

Pepys agreed that Turner's night-soil should be emptied out of Pepys's cellar, although this was done through Turner's own house and with the agreement that his "vault of turds" should either be enlarged or built as a separate structure.[369] Pepys also had a problem with his other neighbours − Sir William Batten and his wife − about the "emptying of our houses of office", but after some discussion it was mutually agreed that it should be done through Pepys's "office".[370] The reasons for these disputes probably lay in the unpleasantness of the process of emptying these vaults. Pepys described how his own cellar was emptied:

"So from thence home, where my house of office was emptying, and I find they will do it with much more cleaness then I expected. I went up and down among them a good while; but … I went to bed and left them [my servants] to look after the people. So to bed … Up about 6 a-clock and find the people have just done; and Hannah not gone to bed yet, but was making clean of the yard and the kitchen … going to Sir W. Batten (having no stomach to dine at home, it being yet hardly clean of last night's turds) …"[371]

---

367 Latham and Matthews, *The Diary of Samuel Pepys*, Vol. 5, p. 249.

368 *Ibid*, Vol. 1, p. 269.

369 *Ibid,* Vol. 4, p. 220.

370 *Ibid*, p. 233.

371 *Ibid*, pp. 252, 253.

The willingness to tolerate such conditions appears to have been general. On one occasion Pepys found that "my wife and maid Ashwell had between them spilt the pot of piss and turd upon the floor and stool and God knows what, and were mightily merry washing of it clean. I took no notice but merrily."[372] On another occasion, Pepys encountered by accident Lady Sandwich in his house, and "I perceive by my dear Lady's blushing that in my dining-room she was doing something upon the pott; which I also was ashamed of and so fell to some discourse…"[373] But there were times when Pepys was irritated by the conditions in which he lived, although he made no attempt to change them:

"… at night home and up to the leads [on the roof]; but were, contrary to expectation, driven down again with a stink, by Sir W. Pen's emptying of a shitten pot in their house of office close by; which doth trouble me, for fear it do hereafter annoy me. So down to sing a little, and then to bed."[374]

Pepys was often bothered by sanitary problems from adjoining houses, including flooding and damp; "In the morning, seeing a great deal of fowle water come into my parler under the partician between me and Mr Davis, I did step thither to him and tell him of it, and did seem very ready to have it stopped."[375] Pepys's basement was certainly subject to damp,[376] but much of it probably due to the internal conditions in his own house. On one occasion he kept a pet eagle in his latrine, but was glad to get rid of it, "she fouling our house of office mightily."[377] He himself was not averse to using other areas of the house for similar purposes: he once "lacked a pot but there was none, and bitter cold, so was forced to rise and piss in the chimney."[378] This is reminiscent of Boorde's earlier warning against the practice: "…beware of pissing in draughts, and permit no common pissing place to be about the

372 Latham and Matthews, *The Diary of Samuel Pepys,* Vol. 4, p. 155.
373 *Ibid*, Vol. 5, p. 129.
374 *Ibid*, Vol. 7, p. 113.
375 *Ibid*, Vol. 1, pp. 304, 305.
376 *Ibid*, Vol. 7, p. 336.
377 *Ibid*, Vol. 5, p. 352.
378 *Ibid*, p. 357.

house or mansion … And beware of emptying of piss pots, and pissing in chimneys."[379]

Subsequently when Pepys was staying in lodgings in Greenwich to avoid the plague, he resorted to the chimney in the following way:

"And so I to bed, and in the night was mightily troubled with a looseness … and feeling for the chamber pott, and there was none … I was forced in this strange house to rise and shit in the Chimney twice; and so to bed and was very well again …"[380]

This is very similar to what happened in Charles II's court when they spent the summer of 1665 in Oxford to escape the plague; they were castigated by the diarist Anthony Wood, for "though they were neat and gay in their apparell, yet they were very nasty and beastly, leaving at their departure all their excrements in every corner, in chimneys, studies, colehouses and cellars."[381] It is not surprising given these standards of personal hygiene, that the earth in many house floors, particularly that in cellars, was used as a source of saltpetre (potassium nitrate), which resulted from the deposit of excreta and urine either from animals or human beings.[382] The deposit of excreta and urine on floors appeared to have been general in London, for in 1627, the government issued a proclamation stipulating that the earth remaining from demolished houses in London should be made available to the saltpetre men:

"That whensoever any old house or building in London, or within three miles thereof, shall be pulled downe, and the earth and Rubbish is be caried away or remooved, That before any part thereof be stirred or removed, there be notice thereof given at the Kings storehouse for the making of Saltpeter in Southwarke, and that the Deputy or workmen of Saltpeter, doe, and may first take so

379 Poole, *The Wisdom of Andrew Boorde*, p. 22.

380 Latham and Matthews, *The Diary of Samuel Pepys*, Vol. 6, p. 244.

381 Quoted in Razzell, *Essays in English Population History*, p. 205

382 For a general discussion of the use of earth floors as a source of saltpetre see *Ibid*, pp. 203-205.

much of the said Earth or Rubbish, as in their judgement and experience is fittest for Saltpeter for the Kings Service."[383]

In order to maximise the availability of saltpetre (used in the manufacture of gunpowder), the government attempted to prevent the paving "with stone, or bricke, or Floore with board … any Cellar or Vault … or do lay the same with lime, sand, gravell, or other thing, whereby the growth and encrease of the Mine of Saltpeter may be hindered or impaired."[384] It is unclear whether Pepys's cellars were paved or not, or indeed whether his kitchen which adjoined his back yard had an earth floor − most kitchens in the country had earth floors at this time − but certainly the conditions in his basement would have been highly conducive to the growth of saltpetre. The poor sanitary arrangements in Pepys's house were also reflected in the low level of personal hygiene. There is no evidence that Pepys ever took a bath, although he did occasionally wash his hands and face in cold and warm water.[385] He considered that his wife going to a public bath-house was sufficiently unusual to warrant special comment:

"… my wife being busy in going with her woman to a hot house to bath herself, after her long being within doors in the dirt, so that she now pretends to a resolution of being hereafter very clean − how long it will hold, I can guess …"[386]

Pepys was forced to sleep by himself on the next night, "my wife after her bathing alone in another bed."[387] Two nights later he was made to clean himself "with warm water; my wife will have me, because she doth herself."[388] The problem was that there was no running water in the house, and hot water was only available in very limited supply, so that when Pepys washed his "legs and feet

383 Larkin, *Stuart Royal Proclamations*, p. 159.

384 *Ibid*, p. 455.

385 See the discussion of washing and bathing in the companion volume to Pepys's diary, Latham and Matthews, *The Diary of Samuel Pepys*, Vol. 10.

386 Latham and Matthews, *The Diary of Samuel Pepys*, Vol. 6, p. 40.

387 *Ibid*, p. 41.

388 *Ibid*, p. 44.

with warm water" he was forced to do it in the kitchen.[389] On most occasions when Pepys mentioned cleaning himself he referred to rubbing himself clean with a dry cloth.[390] He had a constant problem keeping his hair clean, and on one occasion "had Sarah to comb my head clean, which I find so foul with poudering and other troubles, that I am resolved to try how I can keep my head dry without pouder."[391] Pepys attempted to deal with this problem by having his hair cut very short and wearing a wig, but he found to his dismay that all the wigs he bought were infested with nits.[392] He himself was infested with head and body lice on more than one occasion, and summarised his problem as follows:

"So to my wife's chamber, and there supped and got her to cut my hair and look my shirt, for I have itched mightily these six or seven days; and when all came to all, she finds that I am louzy, having found in my head and body above 20 lice, little and great; which I wonder at, being more than I have had I believe almost these 20 years. I did think I might have got them from the little boy, but they presently look him, and found none − so how they came, I know not; but presently did shift myself, and so shall be rid of them, and cut my hayre close to my head."[393]

Although concerned on this occasion about lice in his hair and on his body, Pepys was much more relaxed when he stayed at an inn in Salisbury: "Up finding our beds good but we lousy. Which made us very merry …"[394] He had a very similar reaction when he discovered fleas in his bed when he stayed at Portsmouth; on this occasion he shared a bed with his colleague and friend, Dr Timothy Clarke, physician to the King's household:

"The Doctor and I lay together at Wiards the Chyrugeons in Portsmouth … We lay very well and merrily. In the morning

389 Latham and Matthews, *The Diary of Samuel Pepys*, Vol. 7, p. 206.
390 *Ibid*, Vol. 3, p. 188.
391 *Ibid*, p. 96.
392 See for example *Ibid*, Vol. 5, p. 212.
393 *Ibid,* Vol. 9, p. 424.
394 *Ibid*, p. 231.

concluding him to be the eldest blood and house of the Clerkes, because all the Fleas came to him and not to me."[395]

This anecdote illustrates one of the central features of personal hygiene in the seventeenth century: there was a strong intimacy and physicality to social life which would have facilitated the spread of much infection and disease. Dr Clarke as a royal physician was responsible for bleeding and giving physic to members of the royal family and attended the Queen during childbirth,[396] and here we see a direct link between the poor personal hygiene of Pepys and his circle and the health of the royal family. Dr Clarke's medical instruments, in particular his lancet used in treatment for bleeding and other operations on members of the royal family, were almost certainly not properly sterilised and therefore a major source of infection.

Clarke's obstetric practices were probably not dissimilar to those of contemporary midwives:

"If the membrane bag of fluid in which the baby had developed had not been broken by the time the midwife arrived, she would put her hand up the mother's vagina and break the membrane with a specially sharpened fingernail, or a sharp-ended thimble … In 1687 a midwife estimated that two-thirds of miscarriages, stillbirths and maternal deaths in childbed were due to colleagues."[397]

Fleas were clearly present in Pepys's own household, although his attitude towards them appeared to be very matter-of-fact: "… I thought myself to be mightily bit with fleas, and in the morning she [my wife] chid her maids for not looking the fleas a-days. But when I rise, I find that it is only the change of the weather from hot to cold …"[398] It is in these casual references that attitudes towards personal and domestic hygiene are so revealing: for example, when Pepys returned home to dine with his friends Batty and Mr How,

---

395 Latham and Matthews, *The Diary of Samuel Pepys*, Vol. 3, p. 70.

396 See for example *Ibid*, Vol. 5, p. 197; *Ibid*, Vol. 7, p. 49.

397 Picard, *Restoration London*, p. 94.

398 *Ibid*, p. 260.

he and his wife "fell out a little about the foulness of the linen of the table …"[399]

On a more intimate level, Pepys makes references to his sexual life revealing much about his own personal hygiene: "… I went up to her [Sarah] and played and talked with her and, God forgive me, did feel her; which I am much ashamed of, but I did no more, though I had so much a mind to it that I spent in my breeches. After I talked an hour or two with her, I went and gave Mr Hunt a short visit, he being at home alone."[400]

Pepys makes no mention of washing or changing of clothes after his many sexual encounters, and it is this physicality and lack of concern with smell which probably accounts for Pepys's reaction to the following incident: "I went to Mr Crews and thence to the Theatre, where I saw again *The Lost Lady* … And here, I sitting behind in a dark place, a lady spat backward upon me by a mistake, not seeing me. But after seeing her to be a very pretty lady, I was not troubled with it at all."[401] Perhaps this tolerance to spitting has a special Pepysian flavour, but a more general tolerance might help explain the entry in the diary: "At night to supper and to bed − this night having first put up a spitting-sheet, which I find very convenient."[402] Perhaps Pepys was only following here current practice, for as Andrew Boorde had advised: "When you be out of your bed, stretch forth your legs and arms, and your body, cough and spit, and then go to your stool to make your egestion … And wash your hands and wrists, your face and eyes, and your teeth, with cold water."[403]

Hygiene within the house was reflected in the sanitary conditions of the surrounding streets; we have already seen how the waste and soil from the house was deposited onto the street, and animal manure was a constant hazard, not only from horses, but from pigs, goats, chickens, ducks and cattle.[404] Pepys

---

399 Latham and Matthews, *The Diary of Samuel Pepys*, Vol. 9, p. 402.

400 *Ibid*, Vol. 3, p. 191.

401 *Ibid*, Vol. 2, pp. 24, 25.

402 *Ibid,* Vol. 3, p. 262.

403 Poole, *The Wisdom of Andrew Boorde*, p.33. The common practice of spitting may have been a factor in the spread of tuberculosis.

404 See Latham and Matthews, *The Diary of Samuel Pepys*, Vol. 3, p. 243. One of the regulations still in force in 1720 required that 'No Man shall have any Kine, Goats, Hogs, Pigs, Hens, Cocks, Capons or Ducks in the open Street, under

constantly complained about the dirt and filth of the roads of London, frequently making it impossible for him to walk from one area of the town to another.[405]

Poor hygiene and inadequate conditions of storage also affected the quality of food and drink. Given the contamination of the soil with excreta and other waste products, and the reliance on wells and pumps, most supplies of water were probably polluted. The ladies accompanying the Portugese Queen complained "much for lack of good water to drink",[406] and although the main staple drink at this time was beer and wine, water was drunk by Pepys and his contemporaries.[407] Milk was also drunk, but sometimes with uncomfortable consequences:

"In our way [from Hackney] drinking a great deale of Milke … I was in mighty pain all night long, of the Winde griping of my belly and making of me shit often, and vomit too … this I impute to the milk that I drank, after so much beer. But the cold, to my washing my feet the night before."[408]

This quote not only reveals an ignorance of the dangers of contaminated drink, but a wariness of washing and bathing which was probably quite general at this time.[409] The diary also has a number of references to polluted food, which Pepys again appears to have been relatively tolerant of, as indicated in the following quote: "…took Commissioner Pett home with me for dinner, where my stomach was turned when my sturgeon came to table, upon which I saw very many little worms creeping, which I suppose was through the staleness of the pickle."[410] He was more ashamed of

---

pain of Forfeiture of the same.' Stow, *A Survey of the Cities of London and Westminster*, Book 2, p. 306.

405 See for example Latham and Matthews, *The Diary of Samuel Pepys*, Vol. 2, pp. 81; 188, 189; *Ibid,* Vol. 4, pp. 3, 12; *Ibid,* Vol. 8, pp. 344, 356, 444; *Ibid*, Vol. 9, pp. 9, 478.

406 *Ibid*, Vol. 3, p. 92.

407 For example, on one occasion, Pepys 'drank on wine, but sent for some water, the beer not being good.' *Ibid*, Vol. 4, p. 265.

408 Latham and Matthews, *The Diary of Samuel Pepys*, Vol. 7, p. 207.

409 *Ibid*, p. 172 for another reference to Pepys blaming the washing of his feet for an attack of colic.

410 *Ibid*, Vol. 3, p. 120.

the meat that his father and mother regularly served the children of Lord Sandwich when they were staying with them: "though they buy good meate, yet can never have it before it stinks − which I am ashamed of."[411]

Venison pasties appeared to have been particularly vulnerable to contamination: "a very good pasty of venison, better then we expected, the last stinking basely."[412] Some of the contamination of meat Pepys attributed to the weather: "… home to dinner, where a stinking leg of mutton − the weather being very wet and hot to keep meat in."[413] With the absence of proper storage facilities, and the very poor hygienic conditions inside the house, it is not surprising that food often became contaminated.

Pepys frequently describes the illnesses and poor health that he and his family, friends and colleagues frequently suffered from, although these are mainly descriptions of symptoms rather than accounts of the diseases involved. It is possible to recognise in the diary all the classical diseases known to exist at this time: plague, smallpox, typhus, tuberculosis, malaria, dysentry, gastro-enteritis, typhoid fever, measles, scurvy, scarlet fever, venereal disease, and a host of other more minor complaints. There are also a large number of deaths referred to in the diary, particularly of infants within the first few weeks of life.[414] It is impossible to calculate an objective measure of mortality from the diary because the references are too piecemeal, but Pepys did list the births and deaths of his own family of origin. There were eleven children born to his father and mother, seven of whom died during childhood; of the four who survived childhood, two of Pepys's brothers died unmarried in their thirties, and his remaining sister married but died at the age of forty-two.[415]

Pepys himself suffered from a stone in the kidney, and what he called colic; this was a chronic disorder and occurred constantly throughout the period of the diary. From the symptoms described − chronic pain, diarrhoea, flatulence and wind − this was

411 Latham and Matthews, *The Diary of Samuel Pepys,* Vol. 5, p. 193.

412 *Ibid*, Vol. 8, p. 375.

413 *Ibid*, Vol. 9, p. 252.

414 For example, Pepys's friends Mrs Knepp and Mrs Pierce both lost infants within the first few weeks of life; see *Ibid,* Vol. 7, pp. 220, 236.

415 *Ibid*, Vol. 5, p. 361.

probably a form of gastro-enteritis, a complaint which also afflicted Pepys's wife, Elizabeth. Pepys also described other illnesses, including fever; on one occasion he described his illness as follows: "having been this day or two mightily troubled with an itching all over my body, which I took to be a louse or two that might bite me − I find this afternoon all my body is inflamed and my face in a sad redness and swelling and pimpled …"[416] This could have been an attack of typhus, but there is no way of knowing from this distance in time what particular illnesses affected Pepys and his circle of family and friends.

As we have seen, in the sixteenth and early seventeenth century infant and child mortality were relatively low in London, in spite of the very poor levels of personal, domestic and public hygiene. Death results from a number of factors, including the virulence of pathogens as well as the hygienic state of the environment.[417] Diseases such as smallpox only became really fatal after the middle of the seventeenth century, and Pepys lived through a period of transition which resulted in the high infant and child mortality of the late seventeenth and early eighteenth century.

Pepys himself survived the hazards of this environment, dying at the age of seventy,[418] but most other members of his family died young, including his wife who died at the age of twenty-nine,[419] leaving Pepys who never remarried, to be survived only by two nephews, his sister's sons.

Changes In Sanitary Conditions And The Disease Environment During The Eighteenth Century

Personal and public hygiene changed radically during the eighteenth century, and probably had a marked impact on the very high levels of mortality amongst elite and other groups outlined in

---

416 Latham and Matthews, *The Diary of Samuel Pepys*, Vol. 4, p. 38.

417 This is illustrated by the current role of the MRSA staphylococcus in hospital deaths, the result of the interaction of a virulent bacteria with the poor hygienic condition of hospital environments.

418 Latham and Matthews, *The Diary of Samuel Pepys*, Vol. 1, p. xl.

419 She died from a fever during a journey to Holland. *Ibid*, p. xxxv.

the earlier sections of the book.[420] London was one of the first areas to experience the decline in infant and child mortality in England, and improvements there also had a major influence on developments elsewhere in Great Britain. As Cruikshank and Burton wrote of the Georgian city: "… virtually all significant developments were pioneered in London. Be it means of financing building speculation and building controls, architectural design, theories and aesthetics, or street paving and lighting, London was always the first testing ground."[421]

One of the major developments in London was the greater introduction of piped water − nine new water companies were founded in London between 1669 and 1806.[422] Strype summarised in 1720 the state of water supply in London as follows:

"… there is not a street in London, but … [that] Waters run through it in Pipes, conveyed under Ground: And from those Pipes there is scarce a House, whose Rent is 15 or 20 pounds per Annum But hath the Convenience of Water brought into it, by small Leaden Pipes laid into the great ones. And for the smaller Tenements, such as in Courts and Alleys, there is generally a Cock or Pump common to the Inhabitants …"[423]

Lucas gave a more detailed statement of improving water supplies in London at the later date of 1756:

"There is not a considerable street in London which is not furnished with such plenty of water, by way of aqueducts or pipes, from various sources, besides what its wells by pumps supply, that not only the ordinary offices on the ground floor, or under it, in every house, but even the upper story of most houses are, or may be, supplied with water by pipes from the common aqueducts in the street. Such is the plenty of this useful element, that in many of the great streets there … are common cocks for watering the streets

---

420 For a discussion of changes in hygiene see Razzell, *Essays in English Population History*, pp. 163-172, 203-205, 223-229.

421 D. Cruickshank and N. Burton, *Life in the Georgian City* (London 1990), p. xiii.

422 R. Porter, 'Cleaning up the Great Wen: public health in eighteenth century London', *Medical History*, Supplement 11 (1991), p. 6.

423 Stow, *A Survey of the Cities of London and Westminster*, Book 1, p. 28.

in summer; from the overflowing of which, most places are supplied with water enough to suppress dust and cool the pavement in the summer, and to wash away their filth in a running stream through their cannals in the winter."[424]

We do not know in detail how these improved water supplies changed the conditions of domestic and personal hygiene, but the outcome was that by the middle of the nineteenth century most houses in London had running supplies of water. Henry Mayhew published in 1861 the results of a survey of water supply and drainage in three different types of parish, the aristocratic parish of St. James Westminster, the middle class parish of St. Anne's Soho, and the poorer parish of St. George the Martyr, Southwark. The great majority of all three parishes had running water to their houses, varying from 81 per cent in St. George's, to 96 per cent in St. Ann's and St. James's.[425] These running supplies of water allowed the introduction of water-closets, and the proportion of houses with this facility varied from 10 per cent in St. George's, 46 per cent in St. Anne's and 66% in St. James's.[426]

But more important than the introduction of water closets was the building of drains in and around the houses, which allowed the removal of kitchen waste and human manure into cesspools outside the house. Such drains were built in 88 per cent of the houses in St.George's, 97 per cent in St. Anne's, and 96 per cent in St. James's.[427] Medical and social historians have emphasized the importance of the water-closet but the introduction of house drainage probably had a more significant impact on health and mortality than any other sanitary improvement. House drains were of course only really possible with the introduction of running water, which allowed the drains to be flushed and waste to be removed from inside the house. The kind of conditions found in Pepys' house − floors and latrine ducts contaminated with excreta and urine − were almost certainly eliminated progressively throughout the eighteenth century by the building of house drains,

---

424 C. Lucas, *An Essay On Water* (London 1756), p. 128.

425 H. Mayhew, *London Labour and the London Poor*, Vol. 2 (London 1862), p. 434.

426 *Ibid*.

427 *Ibid.*

which allowed the removal of cesspits from within the house, to areas in the garden and elsewhere outside the house.

This does not mean to say that sanitary conditions were ideal in mid-nineteenth century London. The surveys reported by Mayhew indicate many sanitary problems − dampness in lower floors, contaminated wells, stagnant water − particularly in the poorest parish, St. George's. There were also areas of London which had no drainage or sewerage at all: in the city parish of Cheapside, sewerage was still being pumped into the streets as late as 1844,[428] but these practices were very exceptional in Victorian London, whereas they had been very common in Pepys's time.

There were also improvements in the streets of London during the eighteenth century, resulting from the passing of a series of private improvement acts between 1740 and the end of the century. The results of these initiatives were described by Thomas Short in 1767: "Many of its [London's] streets have been widened, made straight, raised, paved with easy Descents to carry off the Water; besides Wells in most public Yards; and Pipes for conveying Plenty of fresh Water to keep them clean and sweet."[429]

The businessman, William Hutton had come to London as a young man in the middle of the century, and when he returned in 1785, he was greatly surprised to discover the transformation which had taken place in the city: "The stranger will be astonished at the improvements which have been introduced during the last 35 years and how money could be procured to complete them. He will find every street and passage in the whole city, and its environs, has been paved in one regular and convenient stile ..."[430]

Jones and Falkus have described how the environmental improvements first introduced into London spread into provincial towns during the eighteenth century, and subsequently into rural areas.[431] This dissemination of metropolitan standards of hygiene

---

428 J. Ficlater, 'History and statistics of the sewerage of the Metropolis', *Journal of the Statistical Society*, Vol. 7 (1844), pp. 156, 157. Cheapside was one of the wealthiest areas of London, and the poor public sanitation of some wealthy London districts might explain the lack of a correlation between the wealth of a district and its mortality rate. (See Table 5.6, p. 136)

429 Porter, 'Cleaning Up the Great Wen,' p. 6.

430 *Ibid.*

431 See pp. 122, 123 of the present volume.

and public health into the countryside was described by Heberden in 1813:

"any body, who will be at pains to compare the condition of London, and of all great towns in England during the seventeenth century, with their actual state, and note the corresponding changes which have taken place in diseases, can hardly fail to consider cleanliness and ventilation as the principal agents in producing this reform … The same spirit of improvement, which has constructed our sewers, and widened our streets, and removed the nuisances with which they abounded, and dispersed the inhabitants over a larger surface, and taught them to love airy apartments and frequent changes of linen; has spread itself likewise into the country, where it has drained the marshes, cultivated the wastes, enclosed the commons, enlarged the farmhouses, and embellished the cottages."[432]

Although Malthus stressed economic factors in his theoretical analysis of mortality, in practice he agreed with Heberden's emphasis on public and private hygiene as the main explanatory factor in declining mortality:

"Dr Heberden draws a striking picture of the favourable change observed in the people of England since [the late seventeenth century] … and justly attributes it to the improvements which have gradually taken place, not only in London, but in all great towns; and in the manner of living throughout the kingdom, particularly with respect to cleanliness and ventilation."[433]

Malthus was also aware of the importance of "place" rather than "class"' in determining levels of mortality: "A married pair with the best constitution, who lead the most regular and quiet life, seldom find that their children enjoy the same health in town as in the country."[434] These improvements in personal and domestic

---

[432] W. Heberden, 'Some observations on the scurvy', *Medical Transactions of the Royal College of Physicians*, Vol. 4 (1813), p. 70.
[433] *Ibid*, Vol. 1 (1810), p. 118.
[434] *Ibid*, p.257.

hygiene took place amongst all classes of the community, as described by Frances Place in 1822:

"the change … has taken place, not only in London, but all over the country, in the habits of the working classes, who are infinitely more moral, more sober, more cleanly in their persons and their dwellings, than they were formerly' particularly the women; partly from the success of the cotton manufactures, which has enabled them to discard the woollen clothes which were universally worn by them, which lasted years, and were seldom, if ever washed; partly from increased knowledge of domestic concerns, and the nursing and general management of children. Notwithstanding the vice, the misery and disease which still abounds in London, its general prevalence has been greatly diminished."[435]

The aristocracy and gentry probably played a key role in initiating the historical improvements in hygiene: they were responsible for the building of Queen Anne and Georgian squares in London, and disseminated this style of architecture into provincial towns and villages, along with the new standards of personal, domestic and public hygiene. Domestic servants of the aristocracy and the wealthy probably also helped disseminate the new standards of hygiene, as they visited relatives in the country or set up their own households after marriage.[436] Doctors played a critical part in this process, best evidenced by their role in improving hygiene in the army and navy during this period. Haines and Shlomowitz have recently presented evidence on falling mortality in British slave ships: crude death rates per month fell from 99 per 1000 in 1676-1700 to 37 per 1000 by 1776-1800,[437] a mortality reduction which they largely attribute to the introduction by ships' doctors and surgeons of strict rules of hygiene and sanitation.[438]

---

435 F. Place, *Illustrations and Proofs of the Principles of Population* (London 1930), p. 253.

436 J.J. Hecht, *The Domestic Servant Class in Eighteenth Century England* (London 1956), pp. 200-230.

437 R. Haines and R. Shlomowitz, 'Explaining the mortality decline in the eighteenth century: what we can learn from sea voyages', *Social History of Medicine*, Vol. 11 (1998), Tables 1 and 4.

438 *Ibid*. A similar reduction in mortality as a result of hygienic measures imposed by military authorities is analysed in S. Guha, 'Nutrition, Sanitation,

These improvements in hygiene were a part of a general process taking place in England at this time.[439] M.C.Buer summarized her reading of the literature as follows:

"The importance of fresh air and cleanliness began to be preached by the best doctors in the seventeenth century and with increasing vigour in the eighteenth century. Dirt and 'all nastiness' was condemned as unhealthy … and the origin of disease began to be ascribed to dirt, damp situations, bad water and bad food instead of the will of the Almighty. It would be possible to quote pages of extracts from eighteenth century doctors preaching the efficacy of soap and water and fresh air."[440]

Mary Dobson has recently examined the sources referred to by Buer, detailing the range and complexity of medical and environmental improvements in early modern England.[441]

Conclusion

We are now in a position to summarise the conclusions reached from the review of the evidence discussed in this essay. Recent research indicates that there was little or no correlation between wealth and mortality in the period before the eighteenth century, and that the fall in infant and child mortality happened first among the aristocracy and other wealthy groups.

The following are possible factors in the decline of mortality:

1. The introduction of piped water into town houses which led to both improvements in personal hygiene and better sanitary arrangements resulting from the building of house drains and external cesspools.

---

hygiene, and the likelihood of death: the British army in India c. 1870-1920', *Population Studies*, Vol. 47 (1993).

439 See V. Smith, *Cleanliness in the Development of Idea and Practice in Britain, 1770-1850* (Ph.D. thesis, London School of Economics, June 1985).

440 Buer, *Health, Wealth and Population*, p. 138.

441 M. Dobson, *Contours of Death and Disease in Early Modern England* (Cambridge 1997).

2. The paving and cleaning of streets made under various local improvement acts introduced in nearly all towns during the eighteenth century.
3. The improvement of domestic hygiene associated with the rebuilding of houses in brick and tile − in particular the replacement of earth floors with brick, tile and timber flooring in rural areas during the eighteenth century.
4. The practice of inoculation and vaccination against smallpox introduced during the eighteenth and nineteenth centuries, and other medical innovations such as the use of Peruvian Bark against malaria.
5. The introduction of better feeding practices of infants − particularly the use of colostrum in the first few days of life − and the gradual replacement of solid foods in the early months of life by breast-milk.
6. The progressive elimination of malaria with the drainage of marshlands associated with the development of agriculture.
7. The improvement in personal hygiene associated with the introduction of cotton clothing, the water closet and the bath at the beginning of the nineteenth century.

Some of these changes were linked to economic factors − such as the drainage of marshes, and the provision of public sewers and drains in urban areas − but these were not the primary reasons for the improvements in personal domestic and public hygiene, or the adoption of prophylactic measures against smallpox. Only a minority of the population lived in marshland and urban areas in the eighteenth and early nineteenth century, and most of the improvements in health and life expectancy took place in non-malarial rural areas.

Doctors and surgeons played a key role in these improvements, through their writings and influence on public authorities, which was mediated through elite private patients living in London and other large towns. Royalty and the aristocracy also played an important part in introducing improvements in hygiene and medicine at the beginning of the eighteenth century. For example, Lady Mary Wortley Montagu was responsible for introducing the practice of inoculation into England, and had her son inoculated against smallpox in 1721. The two young royal princesses − Amelia and Caroline − were inoculated in the following year, and the practice became

fashionable generally amongst the aristocracy and gentry, partly as a result of the successful inoculations of the royal children, but also due to publications on the benefits of inoculation fostered by the Royal Society.[442]

These changes were an autonomous development associated with a growing realisation that health and mortality could be radically improved by the adoption of such measures, and were essentially a part of the 'medical enlightenment of the eighteenth century.'[443]

442 P.E. Razzell, *The Conquest of Smallpox* (Firle 1977), pp. 4-6, 40.

443 See A. Cunningham and R. French, *The Medical Enlightenment of the Eighteenth Century* (Cambridge 1991).

7. INTRODUCTION TO NEW EDITION OF *THE CONQUEST OF SMALLPOX.*

Recent Research On The History Of Smallpox.

The Conquest of Smallpox was originally written as a part of the debate on the origins and causes of population increase in eighteenth and early nineteenth century Britain. It attempted to address some of the issues raised by McKeown on the relative roles of economic and medical factors in the decline in mortality during this period.[444]

The extent, age incidence and variation in case-fatality rates are all factors in shaping the demographic consequences of smallpox. It has sometimes been assumed that smallpox was mainly a disease of childhood in Britain,[445] but in some areas it affected more adults than children. In the first edition of *The Conquest of Smallpox* this was not a topic covered in any detail. Data for the age incidence of smallpox in towns indicated that it was a disease of childhood,[446] but no attempt was made to systematically assess the age structure of the disease in the countryside. There was a brief discussion indicating that smallpox did affect many adults in some areas, such as Godalming, in Surrey, but the only detailed data cited was that for Aynho, Northamptonshire, which showed that 43 per cent of cases and 68 per cent of smallpox deaths were of adults.[447]

The age incidence of smallpox is important for three reasons: 1. It is an indication of whether the disease was endemic in a particular area. 2. Case fatality varied very significantly by age. 3. Age incidence had a marked effect on the up-take of inoculation and vaccination.

During the eighteenth century smallpox is known to have been a disease of childhood in Sweden and many other

---

444 T. McKeown, *The Rise Of Modern Population* (London 1976).

445 See for example, S.R. Duncan, S. Scott and C.J. Duncan, 'The dynamics of smallpox epidemics in Britain, 1550-1800', *Demography,* Vol. 30 (1993), p. 407.

446 See Razzell, *The Conquest of Smallpox,* p. 150 for some evidence on this subject.

447 *Ibid*, pp. 153, 166.

European countries.[448] In Britain it was also a disease of childhood in some areas, particularly in cities and large towns. Monro indicated "the inhabitants of Scotland generally have the smallpox in their infancy or childhood; very few adults being seen here in this disease."[449] Haygarth also implied that smallpox was mainly a disease of childhood in Cheshire and Lancashire, quoting evidence that ninety-five per cent of the militia of these counties had contracted smallpox before their entry into the militia.[450]

Evidence from parish registers suggests that there were regional differences in the age incidence of smallpox. The data for 39 parishes reveals the following pattern:[451]

---

448 Razzell, *The Conquest of Smallpox*, p. 151; P. Skold, *The Two Faces Of Smallpox* (Umea 1996), p.105; K.J. Pitkanen, J.H. Mielke and L.B. Jorde, 'Smallpox and its eradication in Finland: implications for disease control', *Population Studies,* Vol. 43 (1989), p.99.

449 See Razzell, *The Conquest of Smallpox*, p. 127.

450 *Ibid,* p. 163.

451 The data for Manchester, Carlisle, Chester, and Kilmarnock is derived from Charles Creighton, *A History of Epidemics in Britain,* Vol. 2 (Cambridge 1894), pp. 527, 536, 538, 554. The figures for Thorton Lansdale and Newton Reigny are from S. Scott and C.J. Duncan, *Human Demography and Disease* (Cambridge 1998), pp. 285, 293. The figures for Whitehaven for 1751-81 are from J. E. Ward, 'Death in eighteenth century Whitehaven: the mortality records from Holy Trinity Church', *Transactions of the Cumberland & Westmorland Antiquarian & Archaelogical Society,* Vol. 98 (1998), pp. 256, 257. The information on smallpox in Birstall, Yorkshire was kindly provided by Michael Drake. All other data is based on the analysis of parish registers in the Society of Genealogists' library. Parishes were selected mainly on the basis of references to smallpox in secondary literature. Where there was specific information on age at death, children were defined as being under twenty-one; otherwise they were categorised as children where they were referred to as "son/ daughter/ child of". The age incidence of cases of smallpox would be different from the figures in this table because of variations in case-fatality by age.

Table 7.1: Smallpox Deaths Amongst Children And Adults In English Parishes.

Place	*Date*	*Number Of Child Smallpox Deaths*	*Number Of Adult Smallpox Deaths*	*Proportion Of Child Smallpox Deaths %*
Northern Parishes				
Penrith, Cumberland	1656-61	60	1	98
Adel, Yorkshire	1685-1702	16	0	100
Skipton-In-Craven, Yorkshire	1716-36	110	4	96
Newton Reigny, Cumberland	1727	9	0	100
Kilmarnock, Scotland	1728-63	622	0	100
Ackworth, Yorkshire	1745-1812	84	1	99
Thorton-in-Lansdale, Yorkshire	1750-56	24	5	83
Whitehaven, Cumberland	1751-81, 1785-86	664	4	99
Manchester, Lancashire	1769-74	588	1	99
Chester, Cheshire	1772-77	369	0	100
Hickleton, Yorkshire	1776-88	2	0	100
Braithwell, Yorkshire	1777-1812	17	0	100
Carlton-Juxta-Snaith, Yorkshire	1777-1812	6	0	100
Addingham, Yorkshire	1777-1812	41	0	100
Burhwalis, Yorkshire	1778-1803	6	0	100
Hindley, Lancashire	1779-1814	160	0	100
Carlisle, Cumberland	1779-1787	241	0	100
Heslington, Yorkshire	1782-1804	5	0	100
Askham Bryan, Yorkshire	1783-1812	6	0	100
Skipton-In-Craven, Yorkshire	1783-1812	196	2	99
Birstall, Yorkshire	1784	41	41	100
South-Western Parishes				
Truro, Cornwall	1767	53	2	96
Whittington, Shropshire	1774-76	14	0	100
Southern Parishes				
Basingstoke, Hampshire	1675-1803	147	188	44
Riseley, Bedfordshire	1690-1742	15	12	56
Godalming, Surrey	1701-23	78	79	50
Calne, Wiltshire	1704-58	211	137	61
Tenterden, Kent	1712-41	10	36	22
Banbury, Oxfordshire	1718-19	61	41	60

Place	*Date*	*Number Of Child Smallpox Deaths*	*Number Of Adult Smallpox Deaths*	*Proportion Of Child Smallpox Deaths %*
Breamore, Hampshire	1720-1803	2	10	17
Aynho, Northamptonshire	1723-24	8	18	31
Great Shefford, Berkshire	1751-67	2	1	66
Rayleigh, Essex	1753	7	18	28
St. Mary's, Southampton, Hampshire	1753-61	22	26	46
St. Mary's, Bury St.Edmunds, Suffolk	1756-57	93	66	58
Burford, Oxfordshire	1758	93	78	54
Cuxham, Oxfordshire	1772	2	6	25
Horton Kerbie, Kent	1772-1801	0	8	0
St. Lawrence, Thanet, Kent	1774-89	57	1	98
Sutton Courtenay, Berkshire	1782-1811	3	6	33

This table must be interpreted with caution. The categorisation of regions is somewhat arbitrary and some of the data refers to the late eighteenth century when inoculation was being practised, and this may have reduced the age at which people caught smallpox. Some parishes were towns with fairly substantial populations − such as Manchester, Carlisle and Chester – and this would have provided the conditions for endemic childhood disease.[452] However, overall the table suggests that there was a north/south divide, with smallpox being a childhood disease in most northern parishes, and affecting both adults and children in southern ones. The two south-western parishes − Truro and Whittington − appear to have fallen into the northern rather than southern pattern.

There is more precise information on age of death in some parishes. In the southern area, only 15 per cent of all smallpox deaths in Tenterden during 1712-42 were under the age

[452] London which is not covered by the table had the vast majority of its smallpox cases amongst young children. See J. Landers, 'Mortality and metropolis: the case of London, 1675-1825' *Population Studies,* Vol. 41 (1987), p. 74.

of ten,[453] compared to 23 per cent in Aynho, Northamptonshire in 1723/24.[454] Likewise, a reconstitution study of Burford in Oxfordshire indicates that 38 per cent of smallpox deaths in 1758 were in this under-ten age category.[455] By comparison, the great majority of smallpox deaths were children under ten in the northern parishes − 88 per cent in Adel, 86 per cent in Ackworth, 94 per cent in Braithwell, 83 per cent in Burhwalis, 83 per cent in Carlton-Juxta-Snaith, 98 per cent in Addingham, 95 per cent in Skipton-in-Craven, 100 per cent in Heslington, Manchester, Chester and Carlisle. These high northern figures are similar to the proportion of smallpox deaths under the age of ten in Sweden during 1756-60 − 94 per cent.[456]

All this data suggests that southern England was quite distinctive in its age structure of smallpox. It may have been partly due to the fact that many of these southern parishes were inland, and that England's island position gave it some protection against the importation of infection. However, in the seaport town of Southampton the majority of smallpox deaths appeared to have occurred amongst adults,[457] and many northern inland districts suffered from smallpox as an endemic disease.

Evidence on inoculation also suggests that smallpox was mainly a disease of children in the north of England. For example, 83 per cent of the people inoculated in the Halifax area by Nettleton in 1723 were children under the age of seven.[458] By contrast, the general inoculations that took place in the south of

---

453 This figure is derived from the analysis of *Dr Cliff's Diary* (Kent Archives Office Maidstone, P364/28/4), which lists the causes and ages of death in Tenterden between 1712 and 1742.

454 For the raw figures for Aynho, see Creighton, *A History of Epidemics,* Vol. 2, p. 520.

455 These figures were derived from J. Moody, *The Great Smallpox Outbreak of 1758* (Burford 1998).

456 The figures for Sweden are from Skold, *The Two Faces of Smallpox* p. 166.

457 It is possible that many of the adult smallpox deaths in Southampton were due to people migrating from the surrounding countryside, and this issue can only be settled by a reconstitution study of one of the parishes in the town.

458 See Razzell, *The Conquest of Smallpox*, p. 175. For other evidence of inoculation of children in the north see *Ibid*, pp. 98-102.

England involved all age groups, as in Brighton "from one day to Near Fourscore Years".[459]

Not only the age incidence, but also the small number of smallpox deaths in some southern parishes suggests that it was possible to avoid the disease for very long periods of time.[460] In a period of more than eight decades in the eighteenth century, there were just twelve smallpox deaths in Breamore, Hampshire and ten of these were adults. In Horton Kerbie, Kent, there were just eight deaths from smallpox in 1772-1801, and this low mortality was probably not the result of inoculation, for the descriptions of people dying from the disease were as follows: "a young woman", "married", "aged 61", "aged 54", "wife", "aged 61", "wife", and "aged 55".

In *The Conquest of Smallpox* I have described how people went to extreme lengths to avoid smallpox in the south of England.[461] A further example is provided by an advertisement placed in the *Chelmsford Chronicle* in 1766:

"A lad between thirteen and fourteen years of age, to be a postillion or an assistant under an older servant. He has not had the smallpox, so would rather chuse a place detached from any town."[462]

Likewise, when Joseph King of Colne Engaine, Essex was called for jury service in 1779, he wrote:

"I am warn'd to appear this day at the Sessions to be one of the Petty Jury, and I should have readily attended but am inform'd that the Small Pox is very much about Chelmsford and its neighbourhood and neither my Selfe Wife nor any of my children have had it, it strikes such a Dread and Horror upon me that I dare

---

459 Razzell, *Conquest of Smallpox,* p. 122. See *Ibid,* pp. 111-122 pages for a discussion of general inoculations and the age groups involved.

460 Haygarth pointed to the small number of smallpox deaths in some southern rural parishes: in three Kent parishes there were only 10 smallpox deaths in the twenty-year period 1762-82. See *Ibid,* p. 195.

461 *Ibid*, p. 151 and the various references to the avoidance of market towns when smallpox was present.

462 J.R. Smith, *The Speckled Monster* (Chelmsford 1987), p. 21.

not venture to attend so I humbly beg of your Worship for this time to excuse me . . .”[463]

This fear of smallpox can be contrasted with the attitude of the general population in the north of England. Writing of Chester, Haygarth noted that “the lower class of people have no fear of the casual [natural] smallpox. Many more examples occurred of their wishes and endeavour to catch the infection, than to avoid it.”[464] Monro observed of Scotland in 1765 that “in the villages the peasants are generally assistant to their neighbours of whose family any is sick … and [do not] fly from the place where it [smallpox] is.”[465]

It is possible therefore that the variations in the age structure of smallpox were due to regional differences in attitude towards the disease. However, the more plausible hypothesis is the reverse: that a fatalistic attitude arose where smallpox was endemic and affected mainly children, whereas in southern rural areas where the disease took an epidemic form and affected children and adults alike, individuals were much more fearful of it.

The question arises as to why smallpox was endemic in northern England, the Scottish mainland and Sweden, characterised generally by dispersed populations of a rural character. In the case of the north of England it was probably partly the result of industrialisation, particularly where industrial villages existed in large numbers and where there were extensive pack-horse routes and regular communication between villages

---

463 Smith, *The Speckled Monster*, p. 24. There is however some evidence that not all diseases were avoided in the way that smallpox was. The mean age of the ten people dying from smallpox in Sutton Courtenay, Berkshire in 1782-1811 was 38 years, compared to the average age of the six measles deaths − 6 years. (See the Sutton Courtenay parish register in the Society of Genealogists’ library). Likewise, the mean age of the forty-five smallpox deaths in Tenterden, Kent during 1712-41 was 30 years, compared with the average age of 10 years for the fourteen people dying from measles and whooping cough. (*Dr Cliff’s Diary*). This suggests that families in these two southern parishes were concerned to avoid smallpox but not the more benign diseases of measles and whooping cough. It is probable that more serious infections were avoided, particularly by the wealthy who had the means to remove their families when threatened. See Austen *The Complete Novels*, p.186.

464 See Razzell, *The Conquest of Smallpox*, p. 72.

465 *Ibid,* p. 127.

and towns. However, this would be less true of Scotland and Sweden, and perhaps the nearest to an explanation of the endemic nature of smallpox in these countries, has been put forward by Deborah Brunton. Noting that the disease was not endemic in the Scottish islands, Brunton observed:

"The epidemiological pattern of smallpox on the islands was not dissimilar to that found on the English mainland, where discrete, densely populated village communities were periodically visited by the disease. In mainland Scotland, however, smallpox showed a quite difference incidence. Much of the Scottish rural population was scattered thinly over the countryside in small settlements, called 'farm touns' consisting of a few families. As a result, infectious diseases travelled through areas very slowly and were present for long periods. In some parishes, smallpox deaths were recorded in five, or even eight, of ten years, though more typically it was present for around one-third of the time."[466]

This suggests that smallpox was difficult to avoid in these areas, which presumably explains why it was a disease of childhood. In the south of England, the smallpox epidemics tended to strike at distinct periodical intervals and were therefore highly visible, enabling avoidance of the disease.

Although it may have been possible for many people to escape smallpox altogether in some southern villages, there could be a penalty to be paid by avoiding the disease in childhood. This is illustrated in a smallpox census carried out on August 1772 in the Oxfordshire village of Cuxham. Twenty-nine children were attacked by the disease, of which only two died − 7 per cent − compared to six of twenty adults − 30 per cent.[467]

---

466 D. Brunton, 'Smallpox inoculation and demographic trends in eighteenth-century Scotland', *Medical History*, Vol. 36 (1992), p. 409.

467 Details of this census are to be found in the Cuxham Marriage Register. What is surprising given the higher fatality amongst adults, is that only 2 adults as against 27 children were inoculated during this epidemic.

There is not a great deal of evidence on the case-fatality rates of smallpox by age during the eighteenth century, but one of the most detailed surveys was that carried out in Aynho during 1723-24:

Table 7.2: Age Incidence Of Smallpox Cases And Deaths In Aynho, Northamptonshire, 1723-24.[468]

Age	*Smallpox Cases*	*Smallpox Deaths*	*Case-Fatality %*
0-4	13	3	23
5-9	15	1	7
10-14	33	3	9
15-20	14	1	7
20-24	16	3	19
25-29	9	3	33
30-39	12	3	25
40+	22	9	41

The evidence suggests that there was a U-Curve distribution of case-fatality, documented in a limited way in *The Conquest of Smallpox*.[469] Although based on small numbers, the evidence for Aynho suggests there was a marked difference in the fatality of smallpox depending on age − with a 7 per cent fatality for the 5-9 age group, and 41 per cent for those over the age of 40.

There is similar evidence for this U-Curve distribution from modern times. The following table summarises the data for the unvaccinated population of Madras in 1961-69:

468 Creighton, *A History of Epidemics*, Vol. 2, p. 520.

469 See Razzell, *The Conquest of Smallpox,* pp. 166-68.

Table 7.3: Age Specific Case Fatality Rates Of Smallpox In Unvaccinated Persons In Madras, 1961-69.[470]

Age Group (Years)	*Number Of Cases*	*Case Fatality %*
0-4	2091	41.7
5-9	708	22.2
10-14	154	11.7
15-19	143	22.4
20-29	260	39.2
30-39	91	44.0
40-44	32	37.0
45+	55	61.5

Neither Tables 7.2 or 7.3 brings out variations in case-fatality amongst young children under the age of ten. Data from the Whitehaven Dispensary for the period 1783-1804 reveals the following pattern:

Table 7.4: Age Specific Case Fatality Rates Of Smallpox In The Whitehaven Dispensary, 1783-1804.[471]

Age Group (Years)	*Number Of Smallpox Cases*	*Number Of Smallpox Deaths*	*Case Fatality Rate %*
0-2	378	139	37
2-5	665	105	16
5-10	308	32	10
10+	36	3	8

Mortality was highest in the 0-2 age group, and nearly four times as high as that in the 5-10 age category. There were no children attacked in Aynho under the age of two, which might explain why the fatality rate in the 0-4 age group in the 1723/24 epidemic was relatively low.

---

470 F. Fenner, *Smallpox and Its Eradication* (World Health Organisation, Geneva 1988), p. 54. For other data on the age case-fatality rates see *Ibid,* pp. 51, 53, 54.

471 See *Annual Reports of the Whitehaven Dispensary, 1783-1804*. (Cumbria Record Office, Whitehaven, Ref: YTHOS 2/60).

The figures in Tables 7.2, 7.3 and 7.4 reveal the complexity of smallpox mortality, and given the variations in age incidence and age-specific fatality rates, it is difficult to draw definitive conclusions about smallpox mortality in eighteenth century Britain. Some remote rural areas in the south may have largely avoided the disease altogether, whereas others less isolated suffered very heavy mortality; for example Burford in Oxfordshire lost about a sixth of its population to smallpox in 1758, which included both adults and children.[472] The disease appears to have affected mainly children in the north of England and Scotland, and in large towns and cities in the south of England. However, fatality would have depended very much on the exact age structure of the disease in these areas.

Age incidence not only affected mortality levels but also the practice of inoculation and vaccination. Brunton has pointed out that general inoculations were largely confined to the south of England, with little evidence that they took place in the north and in Scotland, other than in remote areas like the Shetland Islands.[473] This is probably because endemic smallpox generated a fatalistic resignation, whereas the epidemic form of the disease affected large numbers of adults, creating panic and a resort to mass inoculation and vaccination.

The minimal mortality associated with vaccination undoubtedly helped popularise this new form of inoculation. Many parents feared to impose an immediate hazard on their children where there was a possibility that they might avoid smallpox altogether. The risks of vaccination were sufficiently low to overcome this difficulty. Resistance to vaccination in countries and areas where smallpox was a disease of childhood soon disappeared. This was partly because inoculation had made gradual headway in these places before the introduction of vaccination. By the beginning of the nineteenth century smallpox had also become a very virulent disease, killing large numbers of

472 Moody, *The Great Smallpox.*

473 D. Brunton, *Pox Britannica: Smallpox Inoculation In Great Britain, 1721-1830* (Ph.D. Thesis, University of Pennsylvania 1990).

children in areas where it was endemic, and vaccination became rapidly popular.[474]

The Impact Of Inoculation And Vaccination On Mortality And Fertility.

General inoculations covering all vulnerable members of the population were widely practised in the south of England, a conclusion confirmed by research published since the original edition of *The Conquest of Smallpox.*[475] These mass inoculations covered both children and adults, and were practised from the mid-1760s onwards. The impact of these general inoculations depended on the age incidence of smallpox and the virulence of individual outbreaks of smallpox, as well as any secondary diseases that resulted from smallpox, such as tuberculosis and infantile "convulsions". It is impossible to put a precise figure on this saving of life, but it must have been significant during the end of the eighteenth and beginning of the nineteenth centuries.

Outside the south, the decrease in mortality resulting from the practice of inoculation must have been much more modest. This was documented to some extent in the first edition of *The Conquest of Smallpox*, presenting evidence that inoculation was only gradually adopted in the north of England and in Scotland, and towards the end of the eighteenth century. For example, the proportion of smallpox to all deaths in Hindley, Lancashire was as follows:

---

474 See A. Mercer, *Disease, Mortality and Population in Transition* (Leicester, 1990); D.R. Hopkins, *Princes and Peasants: Smallpox in History* (Chicago 1983).

475 Smith, *The Speckled Monster*; Mercer, *Disease Mortality*; Brunton, *Pox Britannica.*

Table 7.5: Smallpox Mortality In Hindley, Lancashire, 1779-1814.[476]

Period	*Number Of Smallpox Deaths*	*Total Number Of Deaths*	*Smallpox As A Proportion Of All Deaths %*
1779-89	50	277	18.1
1790-99	59	402	14.7
1800-09	45	532	8.5
1810-14	6	251	2.4

Virtually all smallpox deaths in Hindley were of children, with short-interval epidemics occurring every two years. Table 7.5 suggests that inoculation made only modest inroads into smallpox mortality before 1799, but significant falls took place after 1800, probably the result of the practice of vaccination and inoculation.

It is possible to trace the long-term impact of inoculation and vaccination on smallpox mortality in one northern urban parish, the town of Whitehaven. Between 1751 and 1781 there were a total of 3,138 deaths, of which 597 − nineteen per cent − were due to smallpox, most of whom were of children.[477] In 1776 local surgeons began to offer free inoculation to the poor,[478] and in 1781 the Whitehaven Dispensary began to inoculate local people *gratis*. In the following eighteen years 1,309 children were inoculated, of whom only one died.[479] The case-fatality rate of smallpox in Whitehaven was 19 per cent at this time,[480] and therefore these 1,309 inoculations saved about 250 children, an average of about 14 children per year. Given that on average approximately 20 children died annually from smallpox between 1751 and 1781, this represents a very significant saving of life.

However, according to the dispensary's reports, some of the poor continued to resist inoculation until the very end of the

476 These figures are based on an analysis of the Hindley parish register in the Society of Genealogists' library.

477 See *Annual Reports Of The Whitehaven Dispensary*.

478 Ward, 'Death in eighteenth century Whitehaven', p. 257.

479 *Annual Reports of the Whitehaven Dispensary*.

480 *Ibid.*

eighteenth century, and it was not until the year 1804 when vaccination became universally accepted, that smallpox began to disappear as a cause of death in the annual reports.[481]

Smallpox mortality declined in Hindley and Whitehaven in a more-or-less linear fashion during the late eighteenth and early nineteenth century, but in other parishes the pattern was more complex and non-linear. For example, the parish register of Ackworth, Yorkshire gives age and cause of death for the period 1745-1812, revealing the following evidence on smallpox mortality:

Table 7.6: Smallpox Mortality In Ackworth, Yorkshire, 1745-1812.[482]

Period	*Number of Smallpox Deaths*	*Number Of All Deaths*	*Smallpox Deaths As A Proportion Of The Total %*
1745-49	3	75	4.0
1750-59	3	125	2.4
1760-69	46	301	15.3
1770-79	14	168	8.3
1780-89	15	163	9.2
1790-99	9	148	6.2
1800-09	6	175	3.4
1810-12	0	47	0.0

Smallpox mortality was very low before 1760, and only increased to more than 15 per cent in the 1760s. Thereafter mortality declined steadily, until it more-or-less disappeared in the early nineteenth century. The low mortality in the late 1740s and 1750s illustrates the variability of smallpox mortality, something that contemporaries were aware of: "it is sometimes so very Mortal, and at other Times so very mild and Favourable" and "they are

481 *Annual Reports of the Whitehaven Dispensary*

482 The table is based on an analysis of the parish register in the Society of Genealogists' library.

fatal in one Place, favourable in another and not known in a third."[483] However, Table 7.6 also indicates an increase in the virulence in smallpox in the 1760s, perhaps a part of a general growth of case-fatality in the eighteenth century.

The possible influence of smallpox on fertility is discussed briefly in *The Conquest of Smallpox*. Since its first publication, Willibrord Rutten has examined the topic through an analysis of Dutch municipal records. He concluded:

"Survivors of smallpox infection apparently had similar marriage, sterility, and fecundity rates to the general population. It is argued that smallpox was of no significance as an aetiological factor in male infertility."[484]

This conclusion is somewhat at variance with the findings of Skold's work on Swedish data. He concluded that both age at marriage and their fertility were influenced by smallpox, largely through women becoming less attractive as marriage partners due to smallpox pitting.[485] There is a lack of detailed data for Britain, but the limited evidence that is available does not indicate a relationship between smallpox and age at marriage.[486]

There has been virtually no work done on the secondary mortality resulting from smallpox. Voth and Leunig have claimed that smallpox reduced height − and therefore presumably health − amongst recruits to the Marine Society who had survived attacks of smallpox.[487] But their methodology and quality of data have been strongly criticised, and the issue of how

---

483 See Razzell, *Conquest of Smallpox*, p. 174.

484 W. Rutten, 'Smallpox, subfecundity, and sterility: a case study from a nineteenth-century Dutch municipality', *Social History of Medicine*, Vol. 6 (1993), p. 85.

485 Skold, *The Two Faces of Smallpox*, pp. 204, 211, 212, 220.

486 For example, age at marriage in London appears to have risen slightly at the end of the eighteenth century, when smallpox mortality was beginning to fall.

487 H.J. Voth and T. Leunig, "Did smallpox reduce height?: stature and the standard of living in London, 1770-1873", *Economic History Review*, Vol. 49, (1996), pp. 541-560.

smallpox may have affected height has yet to be finally clarified.[488]

Although inoculation and vaccination played a subsidiary part in reducing overall mortality, these prophylactic measures played a major preventative role in protecting the population against the effects of a highly virulent disease. Overall case-fatality amongst young children was of the order of 45 per cent by the 1870s. Smallpox had grown in virulence throughout the eighteenth and nineteenth centuries, and was probably increasing in prevalence with the growth of turnpike roads, canals and railways.[489] By the time civil registration was introduced in 1837, smallpox was largely a disease of young children affecting virtually the whole population.

We can conclude this section by illustrating the fatality of smallpox through quoting one of the Registrar-General's reports for the early 1870s. He illustrated the consequences of neglecting vaccination by comparing mortality in London with that in The Hague:

"It is well known that among the lower classes in Holland a very strong prejudice exists against vaccination. It may be useful to enquire what might be the result in London if the prejudice against vaccination, which is so strongly held by a few in this country, should ever become so widely spread as in Holland. If the same death rate had prevailed in London during the [first] quarter [of 1871] as existed in The Hague during January and February, the

---

488 M. Heintel and J. Baten, 'Smallpox and nutritional status in England, 1770-1873: on the difficulties of estimating historical heights', *Economic History Review,* Volume 51 (1998); P.E. Razzell, 'Did smallpox reduce height?', *Economic History Review*, Volume 51 (1998); T. Leunig and H.J. Voth, 'Smallpox did reduce height: a reply to our critics', *Economic History Review*, Volume 51, (1998); P.E. Razzell, 'Did smallpox reduce height?: a final comment', *Economic History Review*, Vol. 54, (2001); T. Leunig and H.J. Voth, 'Smallpox really did reduce height: a reply to Razzell', *Economic History Review,*Vol. 54 (2001); D. Oxley, '"The seat of death and terror": urbanization, stunting, and smallpox', *Economic History Review*, Vol. 56 (2003); T. Leunig and H.J. Voth, 'Comment on "Seat of death and terror"', *Economic History Review,* Vol. 59 (2006); D. Oxley, '"Pitted but not pitied" or, does smallpox make you small', *Economic History Review*, Vol. 59 (2006).

489 The Registrar-General pointed out the importance of foreign and domestic forms of communication in spreading smallpox; see for example, General Register Office, *Thirty-Fourth Annual Report,* p. xxxi.

deaths from this disease within the Metropolitan Division would have been 38,828 during the three months, instead of the 2,400 which actually occurred."[490]

Conclusion

Inoculation and vaccination had a significant impact on smallpox mortality, but the magnitude of that impact cannot be fully assessed without further research. The age incidence and case-fatality of the disease varied so significantly from place to place that only detailed work on parish registers and other local sources will further clarify the overall magnitude of reductions in smallpox mortality.[491]

However, we can provisionally evaluate the demographic importance of smallpox by comparing the summary evidence on overall mortality and that on inoculation/ vaccination and smallpox mortality. There were major falls in infant, child and adult mortality in London from the middle of the eighteenth century onwards, but the chronology and age structure of these reductions in mortality do not suggest that inoculation played a primary role in this process. Inoculation was not widely practised in London until the end of the eighteenth century, and smallpox mortality did not begin to fall until the 1770s.[492] Also, given that smallpox was mainly a disease of young children in London, inoculation probably made little contribution to the fall in adult mortality that took place from about the 1740s onwards.

Much of the fall in infant/ child mortality occurred in rural parishes at the end of the eighteenth and beginning of the nineteenth centuries, and this was the period when inoculation and vaccination were very widely practised. From the age incidence of smallpox, we would expect these prophylactic measures to make the greatest contribution towards reducing child mortality in

---

490 General Register Office, *Thirty-Fourth Annual Report,* p. xxxi.

491 However, the problems of registration discussed in Chapter 7 of *The Conquest of Smallpox* must be taken into consideration. A further example of registration problems is illustrated by an entry in the Dedham parish register for 1724: " a great Number of Persons who died in this year when ye Small Pox was very fatal, are omitted." See Smith, *Speckled Monster,* p. 192.

492 See Razzell, *The Conquest of Smallpox*, p. 198.

northern parishes. Inoculation also contributed to the reduction of both infant and child mortality in the south of England, although given the age incidence of smallpox − affecting both children and adults in the south − its impact is likely to have been limited.

Adult mortality appears to have diminished in most areas of England in the first half of the eighteenth century, and inoculation and vaccination were only widely adopted at the end of the eighteenth and beginning of the nineteenth centuries. It is therefore unlikely that these prophylactic measures were central to the reduction of adult mortality, which appears to have occurred largely for reasons exogenous to medical and economic developments.[493]

The history of inoculation illustrates the increasing importance of empirical medicine in eighteenth century England. This development was not linked to the classical learning of the ancient universities, but was associated with the dissenting academies and the non-conformist doctors who played such an important role in the development of inoculation practice.[494] Much of this emphasis was also linked to market forces, illustrated in the letters of the Glynde bailiff Thomas Davies, discussing the cost and effectiveness of inoculation practices provided by different inoculators.[495]

In summary, we may conclude that inoculation and vaccination did not play the major role in diminishing overall mortality in Britain during the eighteenth and early nineteenth

---

493 Although inoculation does not appear to have played a major role in the reduction of adult mortality, it prevented the increase in mortality resulting from growing smallpox virulence.

494 See F. M. Lobo, 'John Haygarth, smallpox and religious dissent in eighteenth-century England', A. Cunningham and R. French (eds.), *The Medical Enlightenment of the Eighteenth Century* (Cambridge 1990).

495 See Razzell, *The Conquest of* Smallpox, pp. 82, 84. The importance of market forces in the practice of inoculation is illustrated somewhat humorously by a letter written to the *Chelmsford and Colchester Chronicle* on the 4th March 1768: "All the villages in our neighbourhood [in Northamptonshire] are at present under Inoculation. We have a great variety of practitioners, from the pompous Tye-Wigg down to the greasy night Cap; even boys of seven or eight years perform the operation for a halfpenny a-piece, and succeed surprisingly . . . Giles Wilcox, the sowgelder, who lives near the pinfold, is by far the most in vogue. He takes pupils at 2s 6d a head and teaches 'em the true orthodox method. What the method is I cannot learn, but 'tis said to be preferable to the Suttonian or any other wholesale itinerant operator we have seen yet."

century. However, these prophylactic measures did make a highly significant contribution and were a part of a general process of medical innovation and improvement that were responsible for the reduction in infant and child mortality during the late eighteenth and early nineteenth century.[496]

[496] The wealthy and educated classes played a pioneering role in the adoption and practice of both inoculation and vaccination; for example, Benjamin Pugh wrote in 1779: "the royal family, nobility, and people of fortune, have their children inoculated at the proper ages; the people in middle life inoculate pretty generally; and the poor (seeing so many instances of the happy success of it) are every where desirous of being inoculated as soon as the natural smallpox begins to range near them." *Gentleman's Magazine*, 20 March 1779, p. 52. See also pages 72 and 125 of *The Conquest of Smallpox*.

[PICTURE OF PRINCE REGENT – FIGURE 1]

8. THE HAZARDS OF WEALTH: ADULT MORTALITY IN PRE-TWENTIETH CENTURY ENGLAND. [497]

Introduction

The association between social class and adult mortality has become one of the key areas of research in twentieth century epidemiology and demography. Recently, Wilkinson and Marmot have argued that there is a general link between social inequality and adult mortality, partly mediated through the impairment of immunity resulting from 'status stress'. In support of this thesis, they have quoted references to links between poverty and high mortality in eighteenth and nineteenth century England.[498] Davey Smith and colleagues have stressed the role of life-style and life-course events, and have also cited historical evidence for a close association between poverty and ill-health.[499]

There is abundant historical and contemporary evidence to indicate that inadequate nutrition, poor housing and over-crowded environments result in increases in mortality.[500] However, much of the historical data for the association between poverty and adult mortality is based on flawed methodology and unreliable evidence.[501] Evidence reviewed earlier indicates that

---

497 Written jointly with Christine Spence and first published in the *Social History of Medicine*, Vol. 19 (2006).

498 R.G. Wilkinson, *Unhealthy Societies: the Afflictions of Inequality* (London 1996); R.G. Wilkinson, 'Health inequalities: relative or absolute material standards?' *British Medical Journal,* Vol. 314 (1997); M. Marmot, *Status Syndrome*: *How Your Social Standing Directly Affects Your Health* (London 2004).

499 G. Davey Smith, D. Dorling and M. Shaw (eds.), *Poverty, Inequality and Health in Britain, 1800-2000: A Reader* (Bristol 2001).

500 *Ibid;* B. Harris, 'Public health, nutrition, and the decline of mortality: the McKeown thesis revisited', *Social History of Medicine,* Vol. 17 (2004); H.R. Rashad, R. Gray and T. Boerma, *Evaluation of the Impact of Health Interventions* (International Union for the Scientific Study of Population, Belgium 1995); P.G. Lunn, 'Nutrition, immunity and infection', R. Schofield, D. Reher and A. Bideau (eds.), *The Decline of Mortality in Europe* (Oxford 1991).

501 For an example of the faulty use of age at death as a basis for calculating adult expectation of life see E. Chadwick, *Report on the Sanitary Condition of the Labouring Population of Great Britain* (Edinburgh 1965), pp. 219-27; for a critique of this method see the General Register Office, *Fifth Annual Report*, pp. xxviii-xxxi.

before the twentieth century male adult mortality in England may have been as high among the wealthy as it was in the general population, and, in some periods and places, may have been higher than it was among the poor. Given the known link between poverty and mortality, this contradiction represents an historical puzzle which warrants further investigation. This essay will explore the possible reasons for this conundrum, discussing a range of evidence from contemporary sources, and linking this with current understanding of health and mortality amongst the adult population.

The data we present is limited in scope, both in the size of samples and the geographical areas covered, and suffers from a lack of randomness due to the self-selected nature of much of the source material. However, the evidence from a number of independent sources suggests certain provisional conclusions, and provides the basis for more systematic and comprehensive research in the future.

Socio-Economic Status And Adult Mortality Before The Twentieth Century.

One of the most reliable studies of socio-economic status and mortality before the twentieth century is that by Hollingsworth on the aristocracy. It is possible to compare his findings with those for England and Wales, in the middle of the nineteenth century, following the introduction of civil registration.

Table 8.1: Expectation Of Life (Years) At Aged 20 Amongst The Aristocracy And The Population Of England & Wales.[502]

Cohort Born	*Males*	*Females*
Aristocracy , 1825-49	42.0	48.3
England and Wales, 1840-41	39.2	41.7
Aristocracy , 1850-74	42.9	52.1
England and Wales, 1860-61	42.7	45.7

502 T.H. Hollingsworth, 'The demography of the English Peerage' to *Population Studies,* Supplement, Vol. 18 (1965), pp. 54, 58.

Among men, the aristocracy had a slight advantage in life expectancy at age 20 in the first cohort, but this had disappeared by the later period, whereas female aristocrats had higher adult life expectancy in both periods. These findings make no allowance for place and the role of disease environment in shaping mortality levels.[503] This can be illustrated through research on the peerage published by the Victorian actuaries Bailey and Day in 1863. They compared the life expectancy of the peerage with Farr's findings on the general population of England and the population living in healthy districts.

Table 8.2: Mean Adult Male Duration Of Life Amongst The Peerage And In England, Mid-Nineteenth Century.[504]

Age	*Peerage Families*	*English Table Dr. Farr*	*Healthy Districts Dr. Farr*
20	41.46	39.99	43.40
30	35.51	33.21	36.45
40	28.33	26.46	29.29
50	21.40	19.87	22.03
60	14.56	13.60	15.06
70	8.77	8.55	9.37

Life expectancy was slightly higher at all ages among the peerage than in the general English population, although it was less than for those living in healthy districts. The aristocracy spent long periods living in London and in other towns and rural areas, all with different mortality risks. It is therefore important to present data, wherever possible, within geographical regions and districts, and to attempt to control for the role of place in shaping mortality levels.

As seen previously, the East Kent marriage licences yield data on occupation and paternal mortality for 289 parishes in the

503 For a discussion of the role og geographical place in shaping mortality see Essay 4 of the present volume and E. Garrett, A. Reid, S. Szreter, and K. Schurer, *Changing Family Size in England and Wales: Place, Class and Demography, 1891-1911* (Cambridge 2001).

504 A. Bailey Hutcheson and A. Day, 'On the rate of mortality prevailing amongst families of the peerage during the nineteenth century', *Journal of the Statistical Society*, Vol. 24 (1863), p. 69.

period 1619-1809, which indicates that adult mortality was slightly lower among gentlemen, merchants and professionals than in other occupational groups in the seventeenth century, but higher in the second half of the eighteenth century.[505] The latter finding is confirmed by the analysis of marriage licences in Nottinghamshire and Sussex.[506] Data derived from apprenticeship indentures indicates a positive correlation between wealth and adult mortality in the early seventeenth century among apprentices' fathers both in London and nationally.[507]

The higher mortality amongst the wealthy may have been partly a function of greater ages of fathers, but the limited amount of evidence does not support this conclusion. In the absence of birth control, the average age of fathers was probably largely determined by age of marriage. There is information on socio-economic status and median age of male marriage in Nottinghamshire for the period 1701-1753.[508]

Table 8.3: Median Age Of Marriage (Years) Of Grooms Listed In Nottinghamshire Marriage Licences, 1701-1753.

Period	Gentle-men	Yeoman Farmers	Artisans & Tradesmen	Husbandmen	Labourers
1701-20	26	26	25	27	26
1721-40	28	27	25	26	27
1741-53	25	25	24	26	25

505 Table 4.18, p. 116.

506 See Table 5.5., p. 134.

507 Table 4.9, p. 106, Table 4.10, p. 107.

508 J.D. Chambers, 'The course of population change', D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography* (London 1965), p. 332. The number of marriages in the following table for the different periods are as follows: 1701-20: Gentlemen: 168, Yeomen Farmers: 141, Artisans & Tradesmen: 57, Husbandmen: 487, Labourers: 138; 1721-40: Gentlemen: 118, Yeomen Farmers: 186, Artisans & Tradesmen: 133, Husbandmen: 695, Labourers: 89; 1741-53: Gentlemen: 55, Yeomen Farmers: 412, Artisans & Tradesmen: 119, Husbandmen: 254, Labourers: 85. By the late nineteenth century, men from wealthier socioeconomic groups married significantly later than those from the poorer social classes. See R. Woods, *The Demography of England and Wales* (Cambridge 2000), p. 86.

Table 8.3 suggests that median age of male marriage did not vary greatly between different socio-economic groups in the first half of the eighteenth century.

The evidence from marriage licences and apprenticeship indentures on paternal mortality is subject to a measure of uncertainty because of the lack of exact information on the ages of fathers and the self-selected nature of the samples. More reliable data becomes available with the introduction of national censuses and civil registration in the nineteenth century. As discussed earlier, Farr cited well-based evidence on the average rateable values and associated mortality levels of the different registration districts of London in 1838-1844, which showed no significant association between the wealth of a district and its adult mortality level.[509]

It is possible to construct reliable statistics of adult mortality for the period after 1841 in individual rural and urban parishes by using censuses and information in burial registers. This involves tracking married couples in the 1841 and 1851 censuses, and linking this data with that in the parish burial registers for the intervening years. This methodology has the advantage of triangulation, allowing the comparison of information about widows and widowers in the 1851 census with that in the burial registers. The selection of married couples allows the measurement of independent demographic events for establishing the period at risk − the listing of a spouse in a burial register, the baptism of a child, or the enumeration of the husband or wife in a later census.

To evaluate the impact of socioeconomic status on adult mortality, a sample was constructed for 47 Bedfordshire parishes, selecting the first married couple with elite status in the 1841 census. All professional, merchant and independent families with at least one domestic servant were selected for the elite category − there was an average of 3.2 servants per family − and they were matched with the next labourer's family of a similar age

509 See Table 5.6, p. 136.

in the census schedule.[510] The parishes were chosen in sequence from the Registrar-General's list of 1841 censuses.[511]

Table 8.4: Mortality Amongst Husbands And Wives Enumerated In Bedfordshire Censuses, 1841-1851.

	Number Of Grooms And Brides	*Number Of Traced Cases*	*Percentage Of Traced Cases Dead*	*Number Of Years At Risk*	*Average Age Of Traced Cases (Years)*
Professionals, Merchants and Gentlemen	250	165	16%	1531	39.8
Labourers	250	182	15%	1738	40.7

A total of 250 married couples were included in the sample − 125 from elite families and 125 from labourers' families. Of the 250 husbands and wives in the elite category, 165 were traced (66 per cent) either in the 1851 census or the burial register; the equivalent figure for the labourers' sample was 182 out of 250 (73 per cent). Most of the untraced cases were probably due to migration, as they involved the disappearance of both husband and wife. It is unlikely that burials of both husband and wife were unregistered, given the high quality of the burial registers in these rural parishes at this time. Of 32 widow and widowers identified in the 1851 census, 30 of their spouses were traced in Anglican burial registers between 1841 and 1851, indicating a high degree of burial registration reliability.

---

[510] The age of labourers selected was within plus or minus five years of that of elite husbands.

[511] The parishes are as follows: Ampthill, Arsley, Aspley Guise, Bedford St. Cuthbert's, Bedford St. John's, Bedford St. Mary's, Bedford St. Paul's, Biggleswade, Blunham, Clifton, Clophill, Colmsworth, Cranfield, Dunstable, Eaton Socon, Flitton, Harrold, Haynes, Henlow, Higham Gobion, Holwell, Houghton Conquest, Houghton Regis, Hunwick, Kempston, Keysoe, Langford, Leighton Buzzard, Lower Gravenhurst, Luton, Melchbourne, Northill, Pertenhall, Poddington, Potton, Renhold, Shefford, Shelton, Southill, Stotfold, Streathley, Tilbrook, Tingrith, Toddington, Turvey, Woburn, and Wrestingworth.

Twenty six of 165 elite husbands and wives (16 per cent) died in the decade between 1841 and 1851, whereas the number amongst the 182 labourers' husbands and wives was 27 (15 per cent). This slightly higher mortality among elite families was despite a lower average age of husbands in 1841, and a shorter period at risk. Among wives, mortality was also higher in elite than in labourers' families: 13 out of 79 traced cases died (17 per cent) as against 10 out of 83 (12 per cent). However, the sample sizes are small, and Table 8.4 suggests no significant difference in overall adult mortality between elite and labourers' families in Bedfordshire at this time.

Reliable figures for a wider range of occupations were published by the Registrar-General at the end of the nineteenth century. There was little or no correlation between social group and adult mortality in 1860-61 and 1871, although the white-collar group had the lowest adult expectation of life in this period.[512]

Research carried out by the lead author and associates on copies of civil death registers linked to censuses in Ipswich for the period 1871-1910 includes an analysis of social class and adult mortality for the whole Ipswich population.[513] The latter was measured by tracking families between censuses in the two decades 1871-81 and 1891-1901, and analysing the mortality of husbands and wives where at least one of them survived to be enumerated at the end of the decade.[514]

---

512 Woods, *The Demography*, p. 234.

513 This research was a part of a project carried out jointly with Christine Spence, Ros Davies and Eilidh Garrett. See P.E. Razzell, *The Sociological Study of Fertility and Mortality in Ipswich, 1872-1910* (Report submitted to the Economic & Social Research Council 2006).

514 The survival of one of the partners provided an independent event for the period of observation − ten years − between the dates of the censuses. A fuller analysis of this data will be made at a later date. The categorisation of social class was a modified form of that developed by Stevenson in the 1911 Census, but full details will be provided in a later publication. The numbers of cases on which the mortality figures were calculated by period, social class and age group are as follows: 1871-81: Social Class 1: 16-30: 234, 31-45: 601, 46-60: 462, 61+: 141; Social Class 2: 16-30: 232, 31-45: 526, 46-60: 373, 61+: 76; Social Class 3: 16-30: 685, 31-45: 1287, 46-60: 798, 61+: 145; Social Class 4: 16-30: 608, 31-45: 918, 46-60: 569, 61+: 134; Social Class 5: 16-30: 316, 31-45: 586, 46-60: 395, 61+: 88. 1891-1901: Social Class 1: 16-30: 282, 31-45: 610, 46-60: 478, 61+: 176; Social Class 2: 16-30: 373, 31-45: 736, 46-60: 395, 61+: 132; Social Class 3: 16-30: 896, 31-45: 1536, 46-60: 962, 61+: 265; Social Class 4: 16-30: 675, 31-

Table 8.5: Social Class And Adult Mortality (Per 1000) Among Husbands And Wives, Ipswich, 1871-1881 And 1891-1901.

Social Class	*Period 1871-1881*				*Period 1891-1901*			
	Age Group				Age Group			
	16-30	31-45	46-60	61+	16-30	31-45	45-60	61+
1	56	87	162	326	32	49	111	273
2	52	95	172	329	43	67	134	280
3	42	66	134	338	39	65	120	196
4	54	73	132	299	31	63	119	317
5	73	84	137	273	47	69	118	282

For most age groups, adult mortality was slightly higher amongst the wealthier social classes than the poorer ones in the period 1871-81, but this pattern began to reverse at the end of the nineteenth century.[515]

The national statistics for England and Wales indicate that since the beginning of the twentieth century, a social class gradient in adult mortality has been progressively established, and the socioeconomic adult mortality differential has widened significantly during the last few decades.[516]

The Role Of Nutrition And Physical Activity.

Given that elite families were much wealthier than other members of the population, and that they had access to far better provision of food, good housing and medical care, why were their adult mortality rates the same or even higher than the rest of the

45: 1197, 46-60: 682, 61+: 164; Social Class 5: 16-30: 513, 31-45: 912, 46-60: 525, 61+: 181.

515 It will be possible to study the national relationship between social class and adult mortality by carrying out a random study of individual families in England and Wales. Such research is being carried out by Kevin Schurer and associates who are studying a 2 per cent random sample of the population of England and Wales, and tracking individual families between the decadal censuses in the period 1851-1901, and linking this data with civil registration information on deaths.

516 Wilkinson, 'Class mortality differentials', p. 308; *Independent Inquiry into Inequalities in* Health, p. 348.

population? The issue becomes even more puzzling in the light of the relatively low adult mortality among labourers and other poor groups. There is much evidence of the inadequate diet of labourers' families in the late eighteenth and early nineteenth centuries, culminating in the 'hungry forties'.[517] Chadwick and others described the very poor quality of much of their housing, and the poverty of labourers − particularly in rural areas − has been very widely documented.[518] Recently, Bernard Harris has argued that nutrition did play a significant historical role in shaping mortality,[519] and there is good evidence that extreme poverty did significantly increase mortality in certain historical periods.[520] These findings increase the puzzle of a lack of a socio-economic gradient in adult mortality before the twentieth century.

However, there is a contemporary literature on wealth and health, which stresses the hazards of wealth rather than of poverty. Thomas Tryon in 1683 wrote:

"Great drinking of *Wine* and *strong Drinks* after full Meals of *Flesh* and *Fish* … do often wound the Health … which many of the richest sort of People in this Nation might know by woful Experience, especially in London, who do yearly spend many Hundreds, (I think I may say Thousands) of Pounds on their *Ungodly Paunches* … for their *Bellies* are swellen up to their *Chins* … their *Brains* are sunk in their *Bellies; Injection* and *Ejection* is the business of their Life, and all their precious hours

---

517 J. Burnett, *Plenty and Want: a Social History of Diet in England from 1815 to the Present Day* (London 1968).

518 *Ibid;* R. Heath, *The English Peasant* (London 1893); P.E. Razzell and R. Wainwright, *The Victorian Working Class: Selections from the Letters to the Morning Chronicle* (London 1973), pp. 4 -11.

519 B. Harris, 'Public health, nutrition and the decline of mortality: the McKeown thesis revisited', *Social History of Medicine,* Vol. 17 (2004). The problem with generalisations about the role of nutrition is that some infectious diseases are known to have varied markedly in their historical virulence, and this may have changed the influence of nutrition on resulting mortality. For example, smallpox had a case-fatality of about 5 per cent in sixteenth century London, whereas by the late nineteenth century this had risen to 45 per cent, and nutrition may have played a different role in the former compared to the latter. For the complex interaction of nutrition and infection in shaping mortality see P.G. Lunn, 'Nutrition, immunity and infection', R. Schofield, D. Reher and A. Bideau (eds.), *The Decline of Mortality in Europe* (Oxford 1991).

520 Davey Smith *et.al.*, *Poverty, Inequality and Health*.

are spent between the *Platter* and the *Glass*, and the *Close-stool* and *Piss-pot*."[521]

Tryon stressed that it was not just eating and drinking that was responsible for obesity, but also physical inactivity, which varied not just between individuals but among different socio-economic groups:

"Suppose a man were to seek *Fat Men* and *Women,* would he go into *Country-Villages* and *poor small Towns* among *Plough-men* and *Shepherds*? … No, no, such a Man's Errand would lie in *great Cities* and *Market-Towns,* where there is store of *strong Liquors* and *Idleness*. … [among] People that live sedentary Lives, and are easie Imployment, more especially of mature Age, as *Gentlemen* and *Citizens*, etc, who use themselves to lie long in Bed in the Morning, and to great Dinners and rich Cordial Drinks …"[522]

Tryon was mainly concerned with the effect of life-style on the health of the wealthy, and had little to say about the ordinary population. The puritan clergyman Richard Baxter did give a detailed account of the lives of the rural poor at the end of the seventeenth century:

"For by the advantage of their labour and health, their browne bread and milk and butter and cheese and cabbages and turnips and parsnips and carrots and onions and potatoes and whey and buttermilk and pease pies and apple pies and puddings and pancakes and gruel and flummery and furmety, yea dry bread, and small drinke, do afford their appetites a pleasanter relish and their bodyes more strength and longer life than all the varieties and fullness of flesh and wines and strong drinkes do, to the idle gluttonous and voluptuous rich men …The worst of the poore mans case as to health, is that they are put to goe through raine and wett, through thick and thin, through heat and cold and oft want that which nature needeth."[523]

---

521 T. Tryon, *The Way to Health, Long Life and Happiness* (London 1683), pp. 313-314.

522 *Ibid*, pp. 320, 341

523 F.J. Powicke, (ed.), *Richard Baxter's the Poor Husbandman's Advocate to Rich Racking Landlords* (London 1926), pp. 22-26.

Baxter understood that the poor were able to enjoy relatively good health as long as they had an adequate diet of fresh vegetables, fruit, dairy and grain products, and engaged in vigorous activity during their working life. He may have exaggerated the quality of the diet of the poor, although he acknowledged that they suffered from the ill-effects of wet and cold.

An understanding of the link between diet, drink, exercise and health had become very general by the early eighteenth century. George Cheyne established his medical reputation through the publication in 1724 of his *Essay on Health and Long Life*, which ran to nine editions, and was translated into a number of different European languages. Cheyne summarized the main argument of this work by quoting Sir Charles Scarborough's advice to the Duchess of Portsmouth: "you must eat less, or use more exercise, or take physic, or be sick."[524]

Cheyne himself had suffered from obesity which he described in his autobiography:

"Upon my coming to London, I all of a sudden changed my whole Manner of Living; I found the Bottle Companions, the younger Gentry, and Free-Livers' to be the most easy of Access … I soon became caressed by them and grew daily in bulk and friendship with these gay gentlemen … and thus constantly dining and supping … my health was in a few years brought into great distress, by so sudden and violent a change. I grew excessively fat, short-breathed, lethargic and listless … My appetite being insatiable I sucked up and retained the juices and chyle of my food like a sponge and thereby suddenly grew plump, fat, and hale to a wonder, but … every dinner necessarily became a surfeit and a debauch, and in ten or twelve years I swelled so such an enormous size that upon my last weighing I exceeded 32 stone."[525]

Although Cheyne acknowledged that his obesity was to some extent a family characteristic, he understood that it was also a function of his life-style. The pattern of consumption of food and

---

524 G. Cheyne, *Practical Rules for the Restoration and Preservation of Health and the Best Means for Invigorating and Prolonging Life* (London 1823), p. 64.

525 R. Porter (ed.), *George Cheyne: the English Malady, 1733* (London 1991), pp. 325-6, 342.

drink by the fashionable was partly the result of economic prosperity and the importation of luxuries:

"Since our wealth has increased and our navigation has been extended we have ransacked all the parts of the globe to bring together its whole stock of materials for riot, luxury, and to provoke excess. The tables of the rich and great (and indeed those who can afford it) are furnish'd with provisions of delicacy, number, and plenty, sufficient to provoke, and even gorge, the most large and voluptuous appetite. …"[526]

Cheyne summarized his general conclusions as follows:

"If any man has eat or drank so much, as render him unfit for the duties and studies of his profession … he has overdone … It is amazing to think how men of voluptuousness, laziness, and poor constitutions, should imagine themselves able to carry off loads of high-seasoned foods, and inflammatory liquors, without injury or pain; when men of mechanic employments, and robust constitutions, are scarcely able to live healthy and in vigour to any great age, on a simple, low, and almost vegetable diet."[527]

Three years after Cheyne published this work, Short wrote his *Dictionary Concerning the Causes and Effects of Corpulency*, in which he concluded that "lean People generally enjoy a far greater Measure of Health" than those who were over-weight.[528] This theme of the damaging effects of excess and obesity, became commonplace in eighteenth and nineteenth century medical writings.

One of the most popular eighteenth century books on medicine was Buchan's *Domestic Medicine* which was first published in 1769, and was frequently reprinted in new editions through to the middle of the nineteenth century. Buchan summarized his view on activity, exercise and health as follows:

---

526 Porter, *George* Cheyne, pp. 49-50.

527 Cheyne, *Practical* Rules, p. 65.

528 T. Short, *A Dictionary Concerning the Causes and Effects of Corpulency* (London 1727), p. 39.

"Those whom labour obliges to labour for daily bread, are not only the most healthy, but generally the most happy … Tis now below any one to walk who can afford to be carried. How ridiculous would it seem to a person unacquainted with modern luxury … to see a fat carcase, over-run with diseases occasioned by inactivity, dragged through the streets by half a dozen horses."[529]

The ill-health of the wealthy was sometimes linked to the incidence of gout, although contemporaries had a broader conception of the disease than would be the case today.[530] The awareness of the ill-effects of over-eating does not appear to have greatly influenced the behaviour of the wealthy in the eighteenth century. Parson Woodforde detailed in his diary his dietary excesses almost on a daily basis. For example, on the February 14th 1791, he wrote, "we had for Dinner Cod and Oyster Sauce, a fillet of Veal rosted, boiled Tongue, stewed Beef, Peas Soup and Mutton Stakes. 2nd Course, a rost Chicken, Cheesecakes, Jelly-Custards &."[531]

Evidence of this sort is, of course, only anecdotal, and may not be typical of the gentry's and aristocracy's consumption of food at this time. However, there are general accounts that suggest that their food consumption may have been excessive. When F. La Rochefoucald visited England in 1784 he described the dining customs of country houses as follows:

"Dinner is one of the most wearisome of English experiences, lasting, as it does, for four or five hours. The first two are spent in eating and you are compelled to exercise your stomach to the full order to please your host. He asks you the whole time whether you like the food and presses you to eat more, with the result that, out of pure politeness, I do nothing but eat from the time that I sit down until the time when I get up from the table … All the dishes

529 W. Buchan, *Domestic Medicine; or the Family Physician* (Edinburgh 1769), pp. 100-1.

530 See for example W. Black, *An Arithmetical and Medical Analysis of the Diseases and Mortality of the Human Species* (London 1973), p. 87.

531 J. Beresford (ed.), *James Woodforde: The Diary of a Country Parson* (Norwich 1999), pp. 262-3.

consist of various meats either boiled or roasted and of joints weighing about twenty or thirty pounds."[532]

Fogel has estimated that the wealthiest tenth of the population consumed more than 4000 calories per adult per day at the end of the eighteenth century,[533] similar to Seebohm Rowntree's finding of 4,039 calories amongst the servant-keeping class in York at the end of the nineteenth century.[534] Commenting on the findings of a survey of the budgets of six of these families, Rowntree concluded that "considering these six diets as a whole, it is clear that the amount of food consumed is in excess of requirements … it is doubtful whether the work done by the six families here considered is more than 'light industrial work', the food requirements … [for which are] 3000 calories of fuel energy."[535]

Rowntree's sample was very small and there is little direct evidence on the effect of diet on obesity levels among the rich at this time. Information was collected on the weight of the wealthy and fashionable when they were weighed at Berry's wine merchants in St. James's Street, London, and weight registers have survived from 1756 to the present day. This, of course, is a self-selected sample, and the consumption of wine is likely to have increased the incidence of obesity amongst this wealthy group. Nevertheless, the information in the registers provides some useful background data, and was used by Francis Galton in his biometric research. He analysed the weights of 139 members of the aristocracy born between 1740 and 1829, and aged 27 to 70. [536] Many aristocrats had their weights taken several times a year, and Galton compiled charts of weight by age for each individual.

He divided his sample into three birth cohorts − 1740-69, 1770-99 and 1800-29 − and found that weight fluctuated much

---

532 F. La Rochefoucald, *A Frenchman in England in 1784* (London 1995), pp. 29-31.

533 R. Fogel, 'Second thoughts on the European escape from hunger: famines, price elasticities, entitlements, chronic malnutrition and mortality rates', S.R. Osmani (ed.), *Nutrition and Poverty* (Oxford 1992), p. 269.

534 B.S. Rowntree, *Poverty: A Study of Town Life* (London 1901), p. 253.

535 *Ibid,* p. 254.

536 F. Galton, 'The weights of British noblemen during the last three generations', *Nature*, Vol. 17 (1884).

more significantly in the first cohort, concluding that "there can be no doubt that the dissolute life led by the upper classes about the beginning of [the nineteenth century] … has left its mark on their age-weight traces."[537] Although sample sizes were small, Galton calculated mean weights for the different cohorts, and the overall average declined from 179 pounds to those born in 1740-69 to 171 pounds in 1800-29.[538] The mean average of all the weights taken for the whole sample of 139 individuals is 174 pounds − 12 stone 6 pounds.

There is no information on the heights of the peerage, but there is some data on German aristocratic students aged 21 for the period 1772-96. Sixty young aristocrats had a mean average height of 168.8 cm, 6 to 7 cm less than today's equivalent.[539] Galton quoted figures of weight by age for professional men in the early 1880s, ranging from 161 pounds for 27-years olds to 174 pounds for 60-year olds. No heights were recorded, but there is such data on Sandhurst recruits − perhaps representative of the professional group − which indicates an average height of 68 inches for men over the age of twenty-one born during the middle of the nineteenth century.[540] This can be compared to data on the weight and height of contemporary working class populations. For example, Liverpool convicts weighed an average of 143 pounds with a mean height of 66 inches during the mid-nineteenth century,[541] indicating that working class men were significantly leaner than their wealthy aristocratic and professional contemporaries.[542]

---

537 Galton, 'The weights of British noblemen', p. 267.

538 *Ibid.*

539 J.M. Tanner, *A History of the Study of Human Growth* (Cambridge 1981), pp. 111-2.

540 R. Floud, K. Wachter and A. Gregory, Height, *Health and History: Nutritional Status in the United Kingdom, 1750-1980* (Cambridge 1991), p.178.

541 J.T. Danson, 'Statistical observations relative to the growth of the human body (males) in height and weight, from eighteen to thirty years of age, as illustrated by the records of the borough gaol of Liverpool', *Journal of the Statistical Society of London*, Vol. 23 (1862), pp. 20-6.

542 Most evidence points to a U-shaped relationship between Body Mass Index and adult mortality. This suggests that both the malnourished and the over-nourished were at higher risk of mortality. See R. Fogel, *The Escape from Hunger and Premature Death, 1700-2100: Europe, America and the Third World* (Cambridge 2004), p. 24.

The association between wealth, dietary excesses, lack of exercise and ill-health continued to be documented into the nineteenth century.[543] The influence of these factors on longevity was summarized by Sinclair in 1833:

"It has been justly observed, that it is not the rich and great, nor those that depend on medicine, who attain old age, but such as use much exercise, breathe pure air, and where food is plain and moderate … Hence it would appear, that the situation of the middle, and even the lower classes of society, is particularly favourable to longevity."[544]

Sinclair somewhat romanticized the condition of the poor, and perhaps a more realistic account is the following description of the life of agricultural labourers at the end of the nineteenth century:

"… wages are for labourers 8s. or 9.s. a week … In wet weather or in sickness his wages entirely cease so that he seldom makes a full week. The cottages, as a rule, are not fit to house pigs in. The labourer breakfasts on tea-kettle broth, hot water poured on bread and flavoured with onions; dines on bread and hard cheese at 2d. a pound, with cider very washy and sour, and sups on potatoes or cabbage greased with a tiny bit of fat bacon. He seldom more than sees or smells butcher's meat. He is long lived, but in the prime of life "crippled up", i.e. disabled by rheumatism, the result of wet clothes with no fire to dry them by for the next morning, poor living and sour cider."[545]

Other descriptions of labourers' life-style suggest a more generous diet, although most accounts indicate that food was often in short supply.[546] Heath noted at the end of the nineteenth century the difference in stature between the farmer and agricultural labourer: "Compare the shapely forms of the young farmers with those of the stunted young labourer, and … compare the stalwart, jovial

543 See for example W. Wadd, *Comments on Corpulency* (London 1829), p. 164; W. Banting, *Letter on Corpulence, Addressed to the Public* (London 1864).

544 J. Sinclair, *The Code of Health and Longevity* (London 1833), p. 404.

545 Quoted in Burnett, *Plenty and Want*, p. 166.

546 *Ibid.*

forms of the elderly farmers with the rheumatic, misshapen forms of the old labourers, and the evil result, not only of over-early work, but of a lifetime of poor and insufficient food and bad lodging, will be manifest."[547]

It may be that poor diet and poverty had a stronger impact on morbidity than mortality among labourers, although as we will now see, other factors may have influenced mortality levels.

The Role Of Alcohol And Tobacco Consumption.

Thomas Tryon summarized the changes that had taken place in the smoking of tobacco during the seventeenth century:

"It is not above sixty or seventy years ago since that only *Gentlemen*, and but a few of those took *Tobacco,* and then so moderately, that one Pipe would serve four or five, for they handed it from one to another … but now every Plow-man has his Pipe to himself."[548]

However, he acknowledged that among ordinary working families "the Expenses which this smoking generally draws with it, have half starved their poor Families",[549] and that wealth played a role in the consumption of tobacco and other luxuries:

"Are not those that live in the most Remote parts of *England,* and far from *Cities* and *Sea-Ports*, where *Money* is scarce, and such things dear, that the common People cannot buy them, most healthful and freest from Diseases? But now these *Out-landish Ingredients* begin to be so much admired, that the *good Dame, viz the Farmers Wife* will sell her *Eggs, Butter, Cheese* and *Wheat* to buy *Sugar, Spice* and *Tobacco* …"[550]

---

547 R. Heath, *The English Peasant* (London 1893), p. 129.

548 Tryon, *The Way to Health*, p.168.

549 *Ibid,* p. 171.

550 *Ibid*, p. 223.

Hogarth more than sixty years later made a similar distinction between the destructive gin-drinking of Londoners and the more healthy habits of the rural poor:

"go into some Country Village, where that Fiery Dragon Gin has not yet spread her Poison, and you will find their Children, though in Rags, yet of a goodly and healthful Look. Their Diet indeed is coarse, but yet it's wholesome; their Drink, though better than small Beer, answers the Ends of Nutrition better than the finest Spirituous Liquors in the World."[551]

He also drew a distinction between the habits of the wealthy and the poor in the countryside:

"The Squire, who does not keep his Cellar full of the best Liquor, is but little regarded by the Farmers and Neighbours; and if the Farmer has not a Tub of the best ready breach'd, or Brandy and other Ingredients for Punch when the 'Squire is pleas'd to honour him with his own and his Friends Company, he must never expect to be invited to the noble Sport of Hunting … And all of them are unanimously of Opinion in one Thing, that is, that they never think they make a Friend welcome unless they make him drunk."[552]

La Rochefoucald in his account of life in English country houses, commented on the amount of alcohol consumed during dinner:

"After the sweets … the table is covered with all sorts of wine, for even gentlemen of modest means always keep a large stock of good wine. On the middle of the table there is a small quantity of fruit, a few biscuits (to stimulate thirst) and some butter, for many English people take it at dessert … One proceeds to drink − sometimes in an alarming measure. Everyone has to drink in his turn, for the bottles make a continuous circuit of the table and the host takes note that everyone is drinking in his turn."[553]

---

551 W. Hogarth, *A Dissertation on Mr Hogarth's Six Prints Lately Published, Viz Gin Lane, Beer Street, and the Four Stages of Cruelty* (London 1751), p. 32.
552 *Ibid,* p. 6.
553 La Rochefoucald, *A Frenchman*, pp. 29-31.

The dangers of alcohol were well-known to eighteenth century writers and artists. One of the most vivid of Rowlandson's satires was *Death in the Bowl*, showing the skeletal figure of Death drinking with a group of obese-looking gentlemen crouched over a bowl of alcohol (Figure 2). Another of his satires showed Death wheeling an obese man away in a wheel-barrow from a tavern, outside of which three portly figures are depicted drinking and smoking tobacco, with Death telling the dead man's wife, "Drunk and alive, the man was thine, But dead & drunk, why − he is mine." (Figure 3).

There is very little systematic evidence on the consumption of alcohol by different socioeconomic groups, but the cost of alcohol probably constrained the amount consumed by the poor. The budgets published by Eden, Davies and others during the eighteenth and nineteenth centuries, showed that the labouring poor bought little alcohol.[554]

However the budgets did not reveal the full story, partly because they took no account of home brewing, but also because they did not adequately measure expenditure on alcohol at taverns and public houses. Eden attempted to summarize the overall position in 1797 as follows:

"Purchased liquor is an article of expenditure particularly prevalent in the South … [although] if taxed, at any time, with drinking too much, he [the labourer] thinks it sufficient … to allege, that, excepting on a Saturday evening, or occasions of festivity, he rarely allows himself more than a pint, or at most, a pot of beer a day … This is not the case in the North; where, besides the pure limpid stream, the general drink of the labouring classes is either whey or milk, or rather milk and water; or, at best, very meagre small beer."[555]

---

554 F.M. Eden, *The State of the Poor, or, an History of the Labouring Classes in England from the Conquest to the Present Period*, Vol. 1 (London 1797); D. Davies, *The Case of Labourers in Husbandry* (Dublin 1796); W. Neild, 'Comparative statement of the income and expenditure of certain families of the working classes in Manchester and Dukinfield in the years 1836 and 1841', *Journal of the Statistical Society of London*, Vol. 4 (1841); Rowntree, *Poverty*.

555 Eden, *The State of the Poor* p. 542.

A hundred years later Richard Heath came to similar conclusions. He noted the prevalence of taverns and beer-shops in rural areas, but writing about the Weald of Sussex concluded:

"… it would be a good thing if … the little beer shops would be shut up, and a vast amount of misery prevented. Not that the peasant of the Weald is a drunkard. He is far too poor for that. It is only on club days, and occasionally on Saturday night, that he gives way. Habitual drinking in the country is the vice of a class in a superior social position."[556]

Rowntree at the end of the nineteenth century also found a relatively small consumption of alcohol amongst the respectable poor: "the families studied [earning under 26 shillings a week] represent the steady, respectable section of the labouring classes, who spend practically nothing upon drink."[557] However, Rowntree echoed Heath when he concluded:

"There is more drinking in Class B [the second poorest group] than in Class A [the poorest group], but this does not imply a lower moral standard. People in Class A are for the most part so absolutely destitute that they could not get much drink even if they wished. And in Class B, as we have seen … the money for drink can only be found, in the great majority of cases, by foregoing some other expenditure which is necessary for maintaining the family in a state of physical efficiency."[558]

556 Heath, *The English Peasant*, p. 187.
557 Rowntree, *Poverty*, p. 237.
558 *Ibid*, p. 58.

[FIGURES 2 AND 3]

More prosperous working-class groups did, however, consume alcohol, and Rowntree estimated that the average expenditure on drink was six shillings a week, absorbing "more than one-sixth of the average total family income of the working classes of York."[559] There is plenty of evidence that alcohol was consumed in large quantities in the second half of the nineteenth century. Samuel Smiles estimated in 1875 that the working classes spent £60,000,000 on drink and tobacco.[560] As John Burnett has pointed out, "when allowance is made for the growing number of teetotallers, it means that many families must have spent a third, and some half or more, of all their income on drink."[561] A degree of prosperity was required for the consumption of drink, and growing real incomes of working class families after the middle of the nineteenth century made this possible.

This was also true of tobacco consumption which fell in the first half of the nineteenth century[562] when real income was probably stagnating or declining, but increased significantly after the middle of the century when incomes were rising.

Table 8.6: Index Of Real Income And The Per Capita Consumption Of Tobacco In The United Kingdom, 1850-1936.[563]

Period	*Index Of Real Income (1850=100)*	*Per Capita Consumption Of Tobacco (Pounds)*
1850-1859	99	1.11
1860-1869	109	1.27
1870-1879	130	1.41
1880-1889	143	1.45
1890-1899	170	1.69

559 Rowntree, *Poverty* p.143.

560 S. Smiles, *Thrift* (London 1905), p. 114.

561 Burnett, *Plenty and Want*, p. 199.

562 Per capita consumption of tobacco was as follows: 1791-1815: 1.11 pounds; 1816-40: 0.84 pounds; 1841-65: 1.06 pounds. B.R. Mitchell and P. Deane, *Abstracts of British Historical Statistics* (Cambridge 1976), pp. 355-58.

563 For the source of data see Mitchell and Deane, *Abstracts*, pp. 343-45, 355-58. We have merged the indices in Mitchell and Deane's Tables 1b and 1c to create a continuous index, by using the overlapping year 1902 for an inflation ratio to adjust the later series.

There was a more-or-less linear relationship between the growth of real income and the per capita consumption of tobacco in the second half of the nineteenth century.

Budgets compiled by Eden, Davies, Rowntree and others showed virtually no consumption of tobacco in respectable working class families, similar to the pattern of alcohol consumption.[564] Tobacco cost about threepence an ounce, and where family incomes were less than ten shillings a week, it would have been impossible for the working poor to sustain a significant consumption of tobacco over extended periods.[565]

The literary evidence indicates that wealthy men smoked tobacco fairly regularly. Smoking rooms were introduced into some country houses as early as the 1720s, and by the middle of the nineteenth century "smoking rooms had become an integral part of most gentlemen's country houses, and guests who did not appear in them for a convivial smoke or game after the ladies had retired were liable to be dragged out of bed to conform to a recognized social convention."[566] The habits of the royal family are illuminating in this respect:

"[Queen Victoria] disliked the habit intensely … Even Prince Albert had not presumed to smoke in her presence; and at Osborne House … a special smoking room was built … The queen could always detect the smell of tobacco on documents which were sent up to her; and her Assistant Private Secrertary, Frederick Ponsoby … and his colleagues took to carrying peppermints in their pockets in case a summons to the queen came at a moment when their breath was sure to offend her."[567]

The economic capacity to consume tobacco − along with an excessive consumption of food and alcohol − undoubtedly damaged the health of the wealthy. These patterns of consumption along with a lack of physical activity may have been largely

564 Eden, *The State of the Poor;* Davies, *The Case of Labourers*; Neild, 'Comparative statement'; Rowntree, *Poverty*.

565 C. Hibbert, *The English: a Social History, 1066-1945* (London 1987), p. 559. See also the budgets quoted in Eden, *The State of the Poor;* Davies, *The Case of Labourers*; Neild, 'Comparative statement'; Rowntree, *Poverty*.

566 Hibbert, *The English*, p. 554.

567 *Ibid*, p. 553.

responsible for the high adult mortality of the rich, a theme which can be further explored through the writings of the eminent Victorian actuary, Francis Neison.

The Work Of Francis Neison.

Neison was an actuary who worked for one of the leading insurance companies, and had a life-long interest in the causes of ill-health and mortality. He was sceptical about the emphasis on sanitation and poverty by his contemporaries Farr and Chadwick, and produced a range of evidence to show the importance of personal behaviour, in particular the role of physical activity and the consumption of alcohol.[568] His starting point was evidence on socio-economic status and adult mortality:

"In the year 1843, a report was made, by a committee of actuaries, on the mortality among persons assured by seventeen of the principal assurance companies of this country, and these persons may be fairly considered to belong to the middle and upper classes of society; and at various periods since the year 1824, inquiries have been made into the mortality rate among the members of friendly societies, including the more industrious and prudential of the working and the labouring portion of the people. One important result derived from these investigations is, that … [the] information clearly proves the mortality of the middle and upper classes to be above, and that of the industrious working classes to be below, the ratio for the country generally."[569]

In attempting to explain this unexpected finding Neison pointed out the importance of the characteristics of members of friendly societies:

"Their incomes are very limited, affording but the scantiest and simplest means of support. Their habitations are of an inferior order, being of the cheapest kind, and consequently in the worst streets … For an individual to remain a Member of a Friendly

568 F.G.P. Neison, *Contributions to Vital Statistics* (London 1864).
569 *Ibid*, p. 151.

Society, it is required that he should make his weekly or monthly contribution to its funds; and although a few pence is all that is needed, it presumes on a certain amount of frugality and industrial habit, sufficient to separate him from the reckless and improvident, who are more openly exposed to the vicissitudes − poverty, distress, destitution and disease ..."[570]

Neison recognised that poverty did play a role in creating ill-health, but argued that this was largely a function of variations in individual behaviour. He also contrasted the frugality and temperate habits of friendly society members with that of the wealthy:

"… by tracing the various classes of society in which there exists sufficient means of subsistence, beginning with the most humble, and passing on to the middle and upper classes, that a gradual deterioration in the duration of life takes place … this condition would seem to flow directly from the luxurious and pampered style of living among the wealthier classes, whose artificial habits interfere with the nature and degree of those physical exercises which, in a simpler class of society, are accompanied with a long life."[571]

He provided statistical evidence in support of the thesis that physical activity and alcohol were the key factors in shaping adult mortality patterns. He analysed friendly society records and showed that clerks whose occupation required minimal physical exertion, had a significantly lower expectation of life at all ages than plumbers, painters, bakers and miners. Clerks at age 20 had an expectation of life of 31.8 years, plumbers and painters 36.9 years, bakers 40.0 years, and miners 40.7 years.[572]

---

570 Neison, *Contributions* p. 38.

571 *Ibid,* p. 43.

572 *Ibid,* pp. 54, 55.

Neison classified occupations by amount of physical activity, and whether they were employed outdoors or indoors, and summarized his findings as follows:

Table 8.7: Expectation Of Life (Years) Amongst Friendly Society Members.[573]

Age	*Indoor Occupations With Little Exercise*	*Indoor Occupations With Great Exercise*	*Outdoor Occupations With Little Exercise*	*Outdoor Occupations With Great Exercise*
20	41.9	42.0	37.8	43.4
30	35.1	34.5	30.1	36.6
40	27.9	27.8	23.0	29.1
50	20.5	21.2	17.3	22.0
60	14.0	15.1	11.0	15.6
70	8.6	10.4	4.6	9.3

The unhealthiest occupations were those carried out outdoors with little exercise, followed by indoor occupations with little or great exercise. The healthiest occupations were those involving great exercise but carried out outdoors. Table 8.7 suggests that working outside did carry some health penalties − presumably through the effects of cold and damp − but that outdoor occupations with much physical activity conferred significant health benefits.

Neison carried out a special survey of mortality among those with "intemperate habits" through sending out questionnaires to insurance companies, asking for information on insured members from medical personnel. He found a very strong mortality gradient, with those having "intemperate habits" − presumably mainly those addicted to alcohol − having much higher levels of mortality.

573 Neison, *Contributions* p. 456.

Table 8.8: Mortality Among Persons Of Intemperate Habits Compared To That Of The General Population In England & Wales.[574]

Age	*Number Of Those With Intemperate Habits Exposed To Risk*	*Died*	*Mortality Per Cent*	*General Population In England & Wales, Mortality Per Cent*	*Proportion Of Intemperance Mortality To That Of England & Wales*
16-20	74.5	1	1.342	.730	1.8
21-30	949.0	47	4.953	.974	5.1
31-40	1861.0	86	4.620	1.110	4.2
41-50	1635.5	98	5.992	1.452	4.1
51-60	966.0	62	6.418	2.254	2.9
61-70	500.5	40	7.992	4.259	1.9
71-80	110.0	20	18.182	9.097	2.0
81-90	15.0	2	20.000	19.904	1.0

There are problems with the interpretation of Table 8.9 − the nature of the sample, its socio-economic and geographical composition − but its findings are plausible: those who drank large quantities of alcohol − and probably smoked tobacco − suffered levels of mortality in some age groups four or five times higher than the general population.

Neison assumed that he had largely refuted the arguments of Farr, Chadwick and other sanitarians, but there is no inconsistency between the importance of disease environment on the one hand, and the role of lifestyle on the other. There is evidence for the importance of both, and the relative role of these variables will depend upon particular historical and social circumstances.[575]

574 Neison, *Contributions* p. 204.

575 J.C. Riley, *Rising Life Expectancy: a Global History* (Cambridge 2001).

Wealth And Mortality Among Women.

The small amount of available evidence on female adult mortality is ambiguous before the twentieth century. Tryon claimed at the end of the seventeenth century that women's health suffered because of their life-style:

"… there being hardly any Women in the known-World that are such great Drinkers and lovers of strong liquors as the *English* ... the too frequent drinking of *Wine* and *strong Drinks,* which … makes her lose her way … [and the] Inconveniences the Mother suffers, the Child partakes thereof, both in the time of Pregnancy (or breeding) and whilst it sucks."[576]

He claimed that wealthy women were less healthy than the poor, resulting from their physical inactivity:

"Women ought *not to lie too long in* Bed, as most of them that are of any Quality or Ability do … if they do but use any kind of Exercises, and hereby their Travail in Child-bearing is tenfold more burthensom than otherwise it would be, witness many ordinary Country People, who have nothing the trouble such times as our *fine lazy sluggabed Dames.*"[577]

There is no systematic evidence on life-style of women in wealthy families. Certainly many of the fashionable women depicted in contemporary pictorial satires were shown as obese and over-weight.[578] Both Pepys and Parson Woodforde describe in their diaries female guests consuming very generous quantities of food and drink,[579] and Woodforde makes reference to female alcoholics of his acquaintance.[580] Dobson quotes Dr George Buxton's diary

576 Tryon, *The Way to Health*, pp. 278, 283-84.

577 *Ibid,* pp. 288-9.

578 A.P. Oppe, *Thomas Rowlandson: His Drawings and Water-Colours* (London 1923); V. Murray, *High Society: a Social History of the Regency Period, 1788-1830* (London 1998).

579 R.C. Latham and W. Matthews (eds.), *The Diary of Samuel Pepys*, 11 Volumes (London 1995); Beresford, *James Woodforde*.

580 Beresford, *James Woodforde*, pp. 20, 99.

for the year 1770, in which "he claimed to have seen many women die miserably" of alcoholism.[581]

Gronow writing in the Regency period, described how women along with men consumed large quantities of food and alcohol during dinner parties:

"… a perpetual thirst seemed to come over people, both men and women, as soon as they had tasted their soup; as from that moment everybody was taking wine with everybody else, till the close of the dinner; and such wine that produces that class of Cordiality which frequently wanders into stupefaction. How all this eating and drinking ended was obvious, from the prevalence of gout, and the necessity of every one making the pill-box their constant bedroom companion."[582]

Irvine Loudon has presented evidence to show that maternal mortality was as high or even higher among middle class as it was among working class mothers during the nineteenth and early twentieth centuries, and this was probably partly due to the delivery of babies by medical practitioners with inadequate obstetric practices.[583] Judith Lewis has argued that there were similar problems with the treatment of pregnant aristocratic women, although her research indicates that only about five per cent of women in peerage families died in childbirth in the period before the mid-nineteenth century, similar to estimated levels in the general population.[584] However, there was a marked drop in maternal mortality among aristocratic women in the nineteenth century, much more rapid and significant than that which occurred amongst the general population, which may have been linked to the development of the anti-sepsis movement in the mid-nineteenth century.[585]

---

581 M. Dobson, *Contours of Death and Disease in Early Modern England* (Cambridge 1997), p. 246.

582 Murray, *High Society.*

583 I. Loudon, *Death in Childbirth: an International Study of Maternal Care and Maternal Mortality, 1800-1950* (Oxford 1992), pp. 243-6.

584 J. Lewis, ' "Tis a misfortune to be a great ladie": Maternal Mortality in the British Aristocracy, 1559-1959', *Journal of British Studies*, Vol. 37 (1998).

585 *Ibid*, p. 33; Loudon, *Death in Childbirth.*

Conclusion

The overall evidence considered provides only minimal support to Wilkinson and Marmot's thesis that social inequality *per se* leads to higher mortality in adults. The absence of a social class gradient in adult mortality before the twentieth century indicates that other factors were more significant. The data considered suggests that there were important health hazards associated with the ownership of wealth − including an excessive consumption of food, alcohol and tobacco, and lack of physical activity − which were linked to high adult mortality amongst the wealthy before the twentieth century.

IV

The Consequences Of Demographic Change

9. DEMOGRAPHY, ECONOMICS AND THE CHANGING SOCIAL STRUCTURE OF ENGLAND DURING THE INDUSTRIAL REVOLUTION.

Introduction

Medieval historians have written extensively of the consequences of the autonomous role of population resulting from the impact of the plague: the transformation of the economy, and changes in feudal tenure and other aspects of the social structure.[586] Economic historians during the 1950s and 1960s also traced the impact of population on the economic and social structure of eighteenth century England: rising prices, declining real incomes amongst the mass of the population, rising agricultural profits, a polarisation of wealth between the rich and the poor and other economic and social changes.[587]

More recently, population economists have begun to analyse the positive impact of population growth on economic development, and have challenged the classical Malthusian assumption that population increase has an overall negative effect on economic growth.[588] Julian Simon and Ester Boserup in particular have analysed in detail the various long-term benefits of population growth: an improvement in transport infra-structure, the development of cities and improved health services, the increase in technical innovation arising from a greater density of population, and the more intensive cultivation of land due to increasing demand for food.[589]

---

586 See J. Hatcher, 'England in the aftermath of the black death', *Past and Present*, Vol. 144 (1994) for a review of the evidence.

587 H.J. Habakkuk, 'The economic history of modern Britian', D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography* (London 1965), p.148; J.D. Chambers, 'The course of population change', D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography* (London 1965); J.D. Chambers, *Population, Economy and Society in Pre-Industrial England* (Oxford 1972).

588 See J. Simon, 'Introduction', J. Simon (ed.), *The Economics of Population: Key Modern Writings,* Vol. 1 (Cheltenham 1997).

589 Simon, 'Introduction'; J. Simon, *Theory of Population and Economic Growth* (Oxford 1986); E. Boserup, *The Conditions of Agricultural Growth: the Economics of Agrarian Change under Population Pressure* (Chicago 1965); E.

Simon and Boserup have also agreed with medievalists about the centrality of mortality decline in population growth. However, medieval historians have tended to focus more on the consequences of increases or decreases in labour supply for general economic development, whereas Simon, Boserup and other population economists have emphasized the long-term technical innovations resulting from population growth. This is perhaps partly due to the different periods of history considered by the two different groups, but there is a general agreement that demographic factors had an independent and powerful impact on economic development through the exogenous influence of mortality.

In the late 1950s, Habakkuk put forward a general thesis on the relationship between demographic and economic history in Britain before the nineteenth century. He presented a "heroically simplified version of English history", which ran as follows:

"... long-term movements in prices, in income distribution, in investment, in real wages, and in migration are dominated by changes in the growth of population. Rising population: rising prices, rising agricultural profits, low real incomes for the mass of the population, unfavourable terms of trade for industry − with variations depending on changes in social institutions, this might stand for a description of the thirteenth century, the sixteenth century and the early seventeenth, and the period 1750-1815. Falling or stationary population with depressed agricultural profits but higher mass incomes might be said to be characteristic of the intervening periods."[590]

Habakkuk cited the work of Postan, Phelps-Brown, Fisher, Coleman, Mingay, Chambers and Thomas in support of his argument,[591] and subsequently there has been much research − particularly by medievalists − examining the general impact of population change on the English economy and society.[592] Hatcher for example has concluded that in later medieval and early Tudor

---

Boserup, *Woman's Role in Economic Development* (New York 1970); E. Boserup, *Economic and Demographic Relationships in Development* (Baltimore 1990).

590 Habakkuk, 'The economic history of modern Britain', p. 148.

591 *Ibid*, pp. 147-148.

592 Hatcher, 'England in the aftermath of the black death'.

England population "was one of the major determinants not only of both aggregate and per capita output, but also the distribution of wealth and structure of society."[593] The exogenous influence of population has been easier to establish for the medieval period because of the role of plague in shaping demographic change, although there is the difficulty of accurately measuring changes in population, mortality and fertility during the medieval era.

I will explore this thesis in relation to the period of the classical industrial revolution, arguing that population growth resulting from reduced mortality contributed to the growth of the economy and the development of capitalism through the creation of "surplus labour". This resulted in a range of economic, demographic and social consequences which will explored in some detail.

The Impact Of Demographic Change On The Standard of Living.

There has been a prolonged controversy about the standard of living and how it changed over time, with no real consensus on how average real incomes changed during the eighteenth and early nineteenth centuries.[594] This controversy has largely resulted from the uncertain reliability of data and the complexity of the issues involved.

In the absence of reliable data on real incomes, economic historians have attempted to use average height as a measure of "the biological standard of living". Findings on the eighteenth century period are contradictory, with Floud, Wachter and Gregory finding a general increase in mean height between 1740 and 1800,[595] and Komlos concluding that there was a

---

593 J. Hatcher, *Plague, Population and the English Economy, 1348-1530* (London 1977), p. 11.

594 For the latest evidence on this debate, C.H. Feinstein, 'Pessimism perpetuated: real wages and the standard of living in Britain during and after the industrial revolution', *Journal of Economic History*, Vol. 58 (1998); P.H. Lindert, 'Three centuries of inequality in Britain and America', A.B. Atkinson and F. Bourguignon (eds.), *Handbook of Income Distribution* (Amsterdam 2000).

595 R. Floud and B. Harris, 'Health, height, and welfare: Britain, 1700-1980', R.H. Steckel and R. Floud (eds.), *Health and Welfare during Industrialization* (Chicago 1997), p. 102.

significant decline between 1730 and 1790.[596] Both sets of findings are based on the same data on military recruits, and the contradictory findings are the result of uncertainties regarding sample composition, changes in minimum height requirements and other difficulties.[597] Komlos has also used information on the heights of American runaway servants born in England, and this shows virtually no change in mean height of men born between the 1710s and the 1750s.[598]

One of the problems with all height data is that it tends to be truncated and for limited periods of time. However, a continuous dataset is available from the seventeenth to the nineteenth century. Legal and local authorities placed advertisements in newspapers which described criminals, runaway apprentices, and husbands fleeing from the maintenance of their families. These advertisements usually included estimates of height, and I have carried out a study of the *Northampton Mercury*, covering a wide number of Midland counties.

Table 9.1: Mean Height Of Men Aged 23-50, 1700-1799.[599]

Period Of Birth	*Number of Cases*	*Mean Height (Inches)*
1700-1724	64	67.3
1725-1749	84	67.2
1750-1774	94	67.4
1775-1799	72	67.5

For the period 1700-1750, the above figures are very similar to those compiled by Komlos on runaway servants of English origin

596 Komlos, 'Shrinking in a growing economy?', p.781.

597 *Ibid*, p. 132, 133.

598 J. Komlos, 'A Malthusian episode revisited: the height of British and Irish servants in colonial America', *Economic History Review*, Vol. 46 (1993), p. 777. Komlos has since published data on American militia men born in England which suggests that there was a significant dip in mean height in the 1720s, but there are the usual problems of the reliability of data based on military recruits, with uncertainties regarding changes in minimum height requirements. See J. Komlos and F. Cinnirella, 'European heights in the early 18th century', *Economic and Human Biology*, Vol. 30 (2005).

599 I extracted all cases with information on height in the period covered by Table 9.1. I would like to thank Bernard Harris for help in preparing these figures.

for 1710-1760.[600] The latter data along with that in table 9.1 suggest that there was no significant change in mean height during the eighteenth century. However, recently some scholars have argued that there was probably no one-to-one relationship between standard of living and height.[601] There has also been controversy over whether smallpox influenced height independently of nutritional status.[602]

The qualitative evidence seems to suggest a worsening of living conditions in the early period of industrialisation.[603] This can be illustrated through the writings of Charles Shaw, who gave the following autobiographical account of his life in the Potteries in the 1830s and 1840s:

"All the great events of the town took place … [in] the market place. During the severity of winter I have seen one of its sides nearly filled with stacked coals. The other side was stacked with loaves of bread, and such bread. I feel the taste of it even yet, as if made of ground straw, and alum, and plaster of Paris. These things were stacked there by the parish authorities to relieve the destitution of the poor. Destitution, for the many, was a chronic condition in those days, but when winter came in with its stoppage of work, this destitution became acute, and special measures had to be taken to relieve it. The crowd in the market-place on such a day formed a ghastly sight. Pinched faces of men, with a stern, cold silence of manner. Moaning women, with crying children in their arms, loudly proclaiming their sufferings and wrongs. Men and women with loaves or coals, rapidly departing on all sides to carry some relief to their wretched homes − homes, well, called

600 Komlos, 'Malthusian episode revisited' p. 777.

601 J. Komlos, 'Shrinking in a growing economy? The mystery of physical stature during the industrial revolution', *Journal of Economic History*, Vol. 58 (1998); Lindert, 'Early inequality'.

602 For recent publications on this controversy, see D. Oxley, '"The seat of death and terror": urbanization, stunting, and smallpox', *Economic History Review*, Vol. 56 (2003); T. Leunig and H.J. Voth, 'Comment on "Seat of death and terror"', *Economic History Review,* Vol. 59 (2006); D. Oxley, '"Pitied but not pitied" or, does smallpox make you small', *Economic History Review*, Vol. 59 (2006).

603 See P.E Razzell and R. Wainwright, (eds.), *The Victorian Working Class* (London 1973).

such … This relief, wretched as it was, just kept back the latent desperation in the hearts of these people."[604]

Population had doubled in the first fifty years of the nineteenth century in England, and although the economy had grown rapidly during this period, it was insufficient to prevent the poverty described by Shaw, particularly in the absence of a significant re-distribution of income.[605]

There is however uncertainty about changes in the structure and distribution of wealth and income in eighteenth and nineteenth century England.[606] Lindert has recently summarised a number of partial conclusions to emerge from the latest research:
"the only period between 1688 and 1914 in which the rent/ wage ratio clearly rose was circa 1750-1810, roughly the period in which the social tables [of Gregory King, Massie and others] show their only rise [of income] in the top-decile and top-quintile … By contrast the separate estimates of wealth-holding inequality and of earnings inequality do not follow the same chronology … When one follows the average levels of estimated new worth by social classes − landed gentry, merchants, yeomen, craftsmen, and so forth − one finds a striking widening of the wealth gaps between

---

604 C. Shaw, *When I Was a Child* (Firle 1980), pp. 42-43.

605 P.H. Lindert, 'When did inequality rise in Britain and America', *Journal of Income Distribution*, Vol. 9 (2000), p.19.

606 C.H. Feinstein, 'The rise and fall of the Williamson curve', *Journal of Economic History*, Vol. 44 (1988); Feinstein, 'Pessimism perpetuated'; S. Horrell and J. Humphries, 'Old questions, new data and alternative perspectives: families living standards in the industrial revolution', *Journal of Economic History*, Vol. 52 (1992); R.V. Jackson, 'Inequality of incomes and lifespans in England since 1688', *Economic History Review*, Vol. 47 (1994); P.H. Lindert, 'Unequal English wealth since 1670', *Journal of Political Economy*, Vol. 94 (1986); P.H. Lindert, 'Who owned Victorian England? The debate over landed wealth and inequality', *Agricultural History*, Vol. 61 (1987); P.H. Lindert, 'Three centuries of inequality'; P.H. Lindert, 'When did inequality rise in Britain and America?', *Journal of Income Distribution*, Vol. 9 (2000); P.H. Lindert and J.G. Williamson, 'Revising England's social tables, 1688-1812', *Explorations in Economic History*, Vol. 19 (1982); P.H. Lindert and J.G. Williamson, 'Reinterpreting Britain's social tables, 1688-1913', *Explorations in Economic History*, Vol. 20 (1983); L.C. Soltow, 'Long-run changes in British income inequality', *Economic History Review*, Vol. 21 (1968); J.G. Williamson, 'Earnings inequality in nineteenth century Britain', *Journal of Economic History*, Vol. 40 (1980); J.G. Williamson, *Did British Capitalism Breed Inequality?* (Boston 1985).

1810 and 1875. The top landed groups and merchants accumulated at a prodigious rate, it would seem, with their wealth growing faster than that of professionals, shopkeepers, yeomen, or craftsmen … [although] even the middling groups gained in absolute real wealth and held their share of the population, instead of slipping down into the proletariat."[607]

Lindert argues that much of the widening of income inequality in the period 1750-1810 was due to a shift in the relative prices of the commodities consumed by the different social classes: "the rich spent a much lower share of their incomes on food than did the poor, and the rich also paid out a smaller share of their income in housing rents. The relative price of food rose something like 25 per cent 1760-1800, then fell back after 1815. Real housing rents quadrupled between 1760 and 1835, again relative to the overall cost of living index."[608]

Lindert believes that demographic factors were more important than economic variables in the growth of inequality during the period 1760-1810,[609] although he implies that the widening of inequality in the subsequent period may have been due more to economic forces. He has linked these different interpretations with two distinct intellectual traditions: the "first follows Malthus and Ricardo in inferring that income gaps were destined to grow wider as a rising population pressed against land, pushing workers down to subsistence while landowners prospered. The second, Marxian, tradition implied that the industrial forces would cause the same widening."[610] I will argue that these two intellectual traditions can be partly reconciled by focusing on the concept of "surplus labour",[611] and that this is a core feature of

---

607 Lindert, 'Three centuries of inequality', pp. 175-178

608 *Ibid*, p. 183.

609 Lindert, 'Early inequality', p. 6.

610 Lindert, 'When did inequality', p. 11.

611 It is necessary to broaden the concept of surplus labour beyond Marx's use of the term. This broadened concept was used by Lewis in his work on the role of surplus labour in economic development. See W.A. Lewis, 'Economic development and unlimited supplies of labour', *The Manchester School of Economic and Social Studies*, Vol. 22 (1954). Lewis's work has influenced the thinking of a number of subsequent scholars including Fei and Ranis. See J.C.H.

demographic and economic development in England during the eighteenth and nineteenth centuries.

The Social Consequences Of Demographic Change.

Most work to date has tended to neglect changes in the social origins of elites as an indication of the changing structure of inequality. In 1963 I published a paper on the social origins of army officers in the Indian and British Home Army.[612] The main findings on the Indian army were as follows:

Table 9.2: Social Origins of Indian Army Officers, 1758-1834. [613]

Period	*Number In Sample*	*Proportional Distribution By Socio-Economic Status*		
		Aristocracy %	Landed Gentry %	Middle Class %
1758-1774	448	2	6	92
1775-1804	626	3	14	83
1805-1834	950	5	19	76

Table 9.2 shows that there was an increase in the numbers of Indian army officers from the aristocracy and landed gentry between 1758 and 1834. Evidence on the home army reveals an even greater rise in the proportion of gentry officers during the same period: increasing from 16 per cent in 1780 to 32 per cent in 1830 [614] – and this was despite a doubling of numbers of officers in the army. It is likely that the increase in aristocratic and gentry officers was due to growing numbers in these groups, mainly resulting from decreasing mortality.[615] On this basis we would

Fei and G. Ranis, *Development of the Labour Surplus Economy: Theory and Policy* (Illinois 1964).

612 P.E. Razzell, 'Social origins of officers in the Indian and British home army: 1758-1962'*, British Journal of Sociology*, Vol. 14 (1963).

613 *Ibid*, p. 249.

614 *Ibid*, p. 253.

615 The impact of population increases is most accurately measured by replacement rates, and according to Hollingsworth's figures the male

expect similar changes in other institutions, particularly with reference to positions of power and privilege. To explore this hypothesis I have analysed the social origins of leading office-holders in the church, army, navy, law and civil service for the period 1500-1849.[616]

I have initially analysed the social origins of all Anglican bishops and archbishops listed in the *Dictionary of National Biography*. [617]

Table 9.3: Social Origins And The Occupations Of Fathers Of Bishops and Archbishops In Great Britain, 1530-1849.[618]

Period Of Birth	Aristocracy %	Gentry, Clergy & Professional %	Merchants, Tradesmen & Others %
1530-1649	2	55	43
1650-1749	11	34	56
1750-1849	23	47	30

There was an increase in the proportion of aristocratic bishops and archbishops from the sixteenth century onwards, mirrored by a decline in the number originating from merchant, trade and other backgrounds.

There was a significant decrease in the proportion of cases with no information on parental background − 48 per cent of the

---

replacement rate amongst the aristocracy increased from 0.791 in 1700-24 to 1.420 in 1775-99, virtually doubling during this period. See Hollingsworth, T.H., 'The demography of the English peerage', *Population Studies,* Supplement 18 (1964), p. 33.

616 There are a number of difficulties, not least the lack of complete information on the social origins of occupants of elite positions in the early period, particularly during the sixteenth century. The categorisation of social origins is also somewhat arbitrary as the aristocratic and gentry categories are reliant on fluid contemporary definitions as to who was eligible for these statuses.

617 From work carried out on *Fasti Ecclesiai Anglicanae* (Canterbury, Rochester and Winchester dioceses) it appears that of the thirty archbishops and bishops appointed after 1700, only two are not listed in the *D.N.B.*, suggesting that this publication is a comprehensive source for this occupational group.

618 The total sample sizes in each period are as follows: 1530-1649: 131; 1650-1749: 79; 1750-1849: 123.

total in 1530-1649 to 7 per cent in 1750-1849.[619] As many of the unknown cases were probably too obscure to reach the attention of contemporary biographers, it is likely that Table 9.3 understates the decline in the percentage of fathers who were merchants, tradesmen or from other low-status occupations.

The status categories may also conceal some of the more subtle sociological differences between different periods. In the sixteenth century, there was a tendency for the fathers of bishops and archbishops to be manual workers and artisans rather than wealthy merchants, whereas the reverse was true in the later periods. Many of the sons of tradesmen, artisans and farmers had been educated at local grammar schools in the sixteenth and seventeenth centuries, whereas by the nineteenth century, sons of merchants and tradesmen were mainly sent to private and the newly fashionable public schools along with their fellow bishops and archbishops from more elite backgrounds.

Lawrence Stone noted the process of polarisation that had taken place earlier in English society during the sixteenth century as a result of population growth: "the excess supply of labour relative to demand not only increased unemployment, but forced down real wages to an alarming degree ... [there was] a polarisation of society into rich and poor: the upper classes became relatively more numerous and their real incomes rose; the poor also became more numerous and their real incomes fell."[620]

Even sharper differences were found amongst other elite occupations for a later period. The following table summarises data on the occupations of fathers of senior army and navy officers, judges, senior churchmen, and leading civil servants selected from volumes 1 to 5 of the *Dictionary of National Biography*.[621]

---

619 The numbers of cases with no information are as follows: 1530-1649: 122; 1650-1749: 28; 1750-1849: 9. The proportions with no information in these periods are 48%, 26% and 7%.

620 Quoted in Chambers, *Population*, *Economy and Society*, p. 139.

621 All army officers over the rank of lieutenant-general were selected for analysis, along with navy officers above the rank of vice-admiral, all judges, bishops and archbishops, and senior members of the civil service. The sample sizes with information on parental background are as follows: 1550-1649: 107; 1650-1749: 93; 1750-1849: 185. The number with no information (percentage of all cases in brackets) is as follows: 1550-1649: 63 (37%), 1650-1749: 44 (32%), 1750-1849: 48 (21%). The decline in the percentage of cases with no information

Table 9.4: Social Origins Of Elite Occupations In Great Britain, 1550-1849.

Period Of Birth	*Aristocracy* %	*Gentry & Professional* %	*Merchants, Tradesmen & Others* %
1550-1649	3%	70%	27%
1650-1749	22%	67%	12%
1750-1849	16%	81%	4%

Again the trend was for the aristocracy to enter elite occupations in greater numbers, and for sons of merchants, tradesmen and others to virtually disappear from these professions by the nineteenth century. The timing of these changes fits with the demographic patterns discussed earlier, with the increase of the aristocracy into elite occupations occurring in the eighteenth century.

Habakkuk provided some evidence in support of this conclusion, arguing that demographic pressures resulted in estate owners reducing "the endowment per child and encouraging younger sons to seek professional careers."[622] The aristocracy presumably used their connections and influence to place their younger sons in positions of power and wealth, excluding sons of merchants, tradesmen and farmers.

In the absence of more comprehensive detailed research, we can only speculate on what the full consequences of demographic change were.[623] The increased competition for place

---

will again tend to lead to an under-statement of the proportion of people with merchant, trade and other backgrounds, particularly in the early period.

622 H.J. Habakkuk, *Marriage, Debt, and the Estate System: English Landownership 1650-1950* (Oxford 1994), p. 637.

623 Not only is there a lack of detailed information on the social origins of men occupying elite positions, but there is at present no data on the numbers of elite occupations. In the case of the army, it would appear that the number of officers doubled between 1780 and 1830, allowing more opportunities independent of demographic change. The increase in the number of positions is not likely to have been the same in all occupations, so that for example in the church the number of clergy probably did not increase all that greatly during the period. There is also the difficulty of having accurate demographic information on the aristocracy and gentry, as Hollingsworth's data has not yet been scrutinised in detail for its quality and reliability.

and position affected all members of the middle and upper classes, and this competition would not have been confined to positions within the church, army, navy, legal profession and civil service. There were great economic opportunities for both the landed and trading classes, through the enclosure of land and the development of the newly expanding enterprises associated with industrialisation. Additionally, the expansion of world trade and the establishment of overseas colonies, provided a wide source of employment for the sons of middle and upper class families.

This was not just an abstract question of economic gain, but was an issue of survival for these groups, who were confronted with the problem of providing portions, positions and situations for their increasing numbers of surviving sons and daughters.

The Impact of Demographic Change On Marriage Patterns.

Malthus's writings reflect the anxieties of his contemporaries in their concern to prevent a deterioration in their standard of living and economic privileges. His "preventative" method applied particularly to the middle and upper classes, whereas the "positive" checks were mainly applicable to the poor.[624] Although Malthus's theory of population stressed the economic basis of marriage and fertility − a growth in wealth leading to earlier marriage and a rise in fertility − in practice he reversed this analysis when describing actual English population growth: "It is not … among the higher ranks of society, that we have most reason to apprehend the too great frequency of marriage …[it is] squalid poverty, particularly joined with idleness, [which] is a state the most unfavourable to chastity …"[625]

Malthus gave in practice a sociological rather than an economic analysis of marriage: "The labouring poor, to use a vulgar expression, seem always to live from hand to mouth. Their

---

624 The evidence in footnote 273, p. 131 suggests that the daughters of elite families married widely and at an early age in the late seventeenth century. It is likely that by the nineteenth century many daughters in these families remained unmarried or married at a later age, illustrating Malthus's "preventative" check. See Hollingsworth, 'The demography', pp. 21, 25.

625 T.R. Malthus, *An Essay on the Principal of Population*, Vol. 2 (Cambridge 1989), pp. 114, 150.

present wants employ their whole attention; and they seldom think of the future. Even when they have an opportunity of saving, they seldom exercise it; but all that they can earn beyond their present necessities goes, generally speaking, to the alehouse … The desire of immediate gratification, and the removal of the restraints to it from prudence … prompt universally to early marriage ..."[626]

He argued that the "carelessness and want of frugality" so prevalent among the poor, was "contrary to the disposition generally to be remarked among petty tradesmen and small farmers,"[627] and that

"poverty itself, which appears to be the great spur to industry, when it has once passed certain limits, almost ceases to operate. The indigence which is hopeless destroys all vigorous exertion … It is the hope of bettering our condition, and the fear of want, rather than want itself, that is the best stimulus to industry, and its most constant and best directed efforts will almost invariably be found among a class of people above the class of the wretchedly poor."[628]

It was this emphasis on "bettering our condition" that led Malthus to stress education and economic independence as the best way of encouraging frugality and a postponement of marriage:

"… to better the condition of the lower classes of society, our object should be to … [cultivate] a spirit of independence, a decent pride, and a taste for cleanliness and comfort among the poor. These habits would be best inculcated by a system of general education and, when strongly fixed, would be the most powerful means of preventing their marrying … [and] consequently raise them nearer to the middle classes of society."[629]

Malthus is expressing here the insight which has informed much of the literature on modern birth control practices: that education − particularly of women − combined with economic opportunity, is

626 Malthus, *An Essay on the Principal of Population* Vol. 1, pp. 359, 439.
627 *Ibid,* p. 359.
628 *Ibid,* Vol. 2, p. 439.
629 *Ibid*, p. 155.

the most powerful way of encouraging fertility reduction. This ran contrary to his general theory of population − that economic growth will inevitably lead to earlier marriage and increased fertility − and the historical evidence also reveals a much more complex pattern regarding the relationship between wealth and marriage than Malthus allowed for.

It is possible to see in Malthus's writings a reflection of the divergence in marriage patterns that took place between different socio-economic groups in the eighteenth and early nineteenth century, with the age of marriage rising amongst the middle and upper classes, but falling amongst the labouring poor. The mean age of marriage of aristocratic women rose during the eighteenth century from 23.5 years for those born in 1700-24 to 25.5 for the 1775-99 birth cohort, matched by the proportion of aristocratic women never marrying − rising from 16.3 per cent for women aged 50 in 1700-24, to 23.9 per cent amongst those aged 50 in 1800-24.[630] In the pre-industrial period the labouring poor married later than the middle and upper classes, whereas by the end of the eighteenth and beginning of the nineteenth century, the reverse was the case. The following table summarises data on marriage ages amongst different occupational groups listed in Gloucestershire marriage licences during 1637-80:

Table 9.5: Median Age at First Marriage Of Women Marrying In Gloucestershire, 1637-1680.[631]

Occupational Group	*Number In Sample*	*Median Age At Marriage (Years)*
Gentlemen	303	22.0
Yeomen	1192	24.4
Husbandmen	166	26.8

There was a strong gradient between socio-economic status and age at marriage in Gloucestershire, with the wealthier occupational groups marrying at an earlier age.[632]

630 Hollingsworth, 'The demography', pp. 21, 25.

631 Chambers, 'The course', p. 332. The figures are an average of the medians in the original table.

Changes in the relationship between socio-economic status and age of marriage are illustrated by the data for Nottinghamshire (See Table 5.2, p.128). The contrast in the marriage ages of wives of labourers and professionals & gentlemen in the period 1670-1769 is as follows:

Table 9.6: Mean Age Of Marriage (Years) Of Spinsters By Occupation Of Groom, Nottinghamshire, 1670-1769.[633]

Period	*Labourers*	*Professional & Gentlemen*
1670-1689	26.1	23.8
1690-1709	25.8	23.9
1710-1729	25.9	24.0
1730-1749	25.6	24.0
1750-1769	25.0	24.7

The wives of labourers were on average more than two years older than those marrying professionals & gentlemen in 1670-1689, whereas by 1750-1769 the mean age of marriage was similar in the two groups. This was the result of a fall in the average age of marriage of labourers' brides of about one year, with a similar but reverse rise for wives of professionals and gentlemen.

The transition in the pattern of socio-economic status and marriage age continued throughout the eighteenth century, evidenced by the following table for Sussex.[634]

---

632 Michael Drake found something similar in Halifax, Yorkshire in the mid-seventeenth century. The median age of women marrying by occupational group was as follows: yeomen: 23; cloth trade: 25; labourers: 30. See Drake, 'An elementary', p. 443.

633 See Table 5.2, p. 128.

634 See F.W.D. Penfold (ed.), 'Sussex marriage licences for the Archdeaconary of Lewes, 1772-1837', *Sussex Record Society*, Vols. 25 and 26 (1917 and 1919); D. Macleod (ed.), 'Sussex marriage licences for the Archdeaconary of Chichester, 1731-74' , *Sussex Record Society*, Vol. 32 (1926); D. Macleod, (ed.), 'Sussex marriage licences for the Archdeaconary of Chichester, 1775-1800' , *Sussex Record Society*, Vol. 35 (1929). The labourers that I selected from these registers were matched with the next case from the list of yeomen, professional or gentlemen marriages.

Table 9.7: Proportion Of Spinsters Marrying Under Twenty-One In The Archdeaconaries Of Chichester And Lewes, Sussex, 1754-1839.

Archdeaconary Of Chichester				
Period	*Labourers*		*Yeomen, Gentlemen & Professionals*	
	Number	Proportion Under 21 %	Number	Proportion Under 21 %
1754-69	142	9	142	22
1770-99	163	25	163	14
Archdeaconary Of Lewes				
Period	*Labourers*		*Yeomen, Gentlemen & Professionals*	
	Number	Proportion Under 21 %	Number	Proportion Under 21 %
1754-69	145	28	145	16
1770-99	224	36	224	16

By the latter half of the nineteenth century, it was the poorer socio-economic groups who were marrying earlier, and as the compiler of the 1911 Fertility Census wrote, "generally speaking, the proportion of early marriage increases and of late marriage decreases as we descend the social scale ..."[635] The figures for key social groups − professionals, unskilled workers and agricultural labourers − are summarised as follows:

Table 9.8: Mean Age At Marriage of Women Enumerated In The 1911 Fertility Census, England And Wales.[636]

Social Class	*Mean Age At Marriage (Years)*
I	25.2
IV	23.0
VIII	23.4

635 *Census of England & Wales, 1911*, Vol. XIII, p. lxxxix.

636 *Ibid*, p. xc.

The review of the evidence above indicates that the association between wealth and early marriage reversed in the eighteenth century, with the middle and upper classes delaying marriage at the same time as the labouring poor began the opposite process of marrying earlier. The reasons for these trends are likely to be complex, and, in the case of labourers and other poor socio-economic groups, they are probably associated with the decline of female employment and the shrinking of economic opportunities during this period.[637] Also, as Drake has pointed out, the decline of economic opportunities probably had a differential impact on the marriage patterns of men and women.[638] Hudson has summarised recent evidence as follows:

"for women of the labouring classes and the poor … marriage was entered more readily and earlier when times were hard, when income earning opportunities were declining and prospects for the celibate were worsening … Where real wages were buoyant and job prospects good for young women, marriage could be delayed either by a woman's own pro-active choice or because of pressure from her family, reluctant to lose an income earner. If male marriage decisions were stimulated directly by rising earnings (and the jury is still out on this) it appears certain that female motivations were not."[639]

If this thesis is correct, the falling age at marriage among labouring women at the end of the eighteenth century was the result of a deteriorating living standards and shrinking economic opportunities. On the present argument, the decline in the standard of living was the result of population growth, creating both more unemployment and greater poverty, and indirectly leading to a fall in the age of marriage of poorer women. The increase in population was largely due to declining mortality, and unlike the poor, the upper and middle classes dealt with resulting population pressure by delaying marriage.

---

637 See K.D.M. Snell, *Annals of the Labouring Poor* (Cambridge 1987); A.S. Kussmaul, *Servants in Husbandry in Early Modern England* (Cambridge 1981).

638 M. Drake, 'Age at marriage in the pre-industrial West', J, Bechofer (ed.), *Population Growth and the Brain Drain* (Edinburgh 1969).

639 P. Hudson, 'Industrialization in Britain: the challenge of micro-history', *Family and Community History*, Vol. 2 (1999), p. 4.

There were other aspects of the social structure affected by population growth, including patterns of literacy. There was a divergence in literacy rates between artisans, tradesmen, yeomen and husbandmen on the one hand, and labourers on the other. Lawrence Stone found that about 45 per cent of labourers in the Oxford Archdeaconary and Gloucester Diocese were illiterate in 1675, a proportion that did not significantly change during the rest of the seventeenth and the whole of the eighteenth century. Yeomen & husbandmen, and artisans & tradesmen all increased their literacy rates in this period: the former from 67 per cent in 1675 to 94 per cent by the beginning of the nineteenth century, and the latter from about 85 per cent to 96 per cent in the same period.[640] The lack of improvement in literacy amongst labourers was probably linked to their increasing pauperisation, making it difficult for them to achieve literacy and escape poverty, in the way described by Malthus.

There is also some evidence that the sale of goods consumed by the wealthy increased more rapidly that those consumed by the ordinary population. The output of tallow candles, used by poorer people, doubled between 1715 and the end of the century, whereas that of wax candles, used by the wealthier classes, increased nearly tenfold.[641] The production of high-quality white glass nearly quadrupled between 1747 and 1801, whereas that of common bottles only began to increase during the 1790s.[642] The import of silk more than doubled in the eighteenth century, whereas the production of strong beer increased by barely more than a half in the same period.[643] These changing patterns of consumption may have been partly a function of an earlier increase in population among the wealthy than the poor, but it is consistent with the trend of socio-economic polarisation, including changes in the social origins of the elites in the church, army, navy, judiciary and civil service, and the patterns of marriage and literacy.

---

640 L. Stone, 'Literacy and education in England, 1640-1900', *Past and Present*, Vol. 42 (1962), pp. 110, 111.

641 T.S. Ashton, *An Economic History of England in the Eighteenth Century* (London 1955), p. 60.

642 B.R. Mitchell and P. Deane, *Abstracts of British Historical Statistics Debt, and the Estate System* (Cambridge 1976), p. 267.

643 See P.E. Razzell, *Essays in English Population History* (London 1994), p. 75.

Habakkuk pointed out that before the middle of the eighteenth century high mortality had the effect of consolidating estates through land being "passed to a collateral who was already a landowner."[644] During the nineteenth century, reduced mortality probably had the effect of increasing pressure on the assets of estates, with the "net result in the long run" of increasing "the burden of encumbrances."[645] This suggests that increasing expectation of life created pressure towards a more equal ownership of land, but this was only one facet of a very complex interaction of demographic, economic and social factors. Habakkuk's findings are consistent with the earlier discussion of Malthusian pressures on the resources of the rich, leading to a series of "preventative" responses, including delayed marriage and a more effective exploitation of resources.

The Influence Of Demographic Factors On Economic Development.

Although no precise measurements are available, we can speculate that most economic activity in the eighteenth and early nineteenth centuries was primarily labour-intensive: the roads, houses, canals, workshops, railways, factories and the infra-structure of an industrial economy were built with labour using only a minimum of technology.

It was labour-intensive London rather than technological Lancashire which was the focus of manufacturing industry in the earliest phase of the industrial revolution,[646] and its chronicler was the great social commentator, Henry Mayhew. Mayhew was very aware of the importance of population for the development of the London economy, and the standard of living of its inhabitants. He analysed the increase of surplus labour under two headings: the growth in the number of labourers and the increase in the amount of labour extracted from the existing labour force, through what he called the "competitive system".

---

644 Habakkuk, *Marriage*, *Debt, and the Estate System*, p. viii.

645 *Ibid*, p. 341.

646 A.L. Beier, 'Engine of manufacture: the trades of London', A.L. Beier and Roger Finlay (eds), *London 1500-1700: the Making of the Metropolis* (Basingstoke 1986).

He saw six ways of bringing about a growth in the number of labourers: "1. By the undue increase of apprentices. 2. By drafting into the ranks of labour those who should otherwise be engaged, as women and children. 3. By the importation of labourers from abroad. 4. By the migration of country labourers to towns, and so overcrowding the markets in the cities. 5. By the depression of other trades. 6. By the undue increase of the people themselves."[647] He grouped the means of increasing the amount of labour from a fixed labour force under seven headings: "1. By extra supervision when the workmen are paid by the day. 2. By increasing the workman's interest in his work, as in piece work, where the payment of the operative is made proportional to the quantity of work done by him ... 3. By large quantities of work given out at one time, as in 'lump-work' and 'contract work'. 4. By the domestic system of work, or giving out materials to be made up at the homes of the workpeople. 5. By the middleman system of labour. 6. By the prevalence of small masters. 7. By a reduced rate of pay, as forcing operatives to labour both longer and quicker, in order to make up the same amount of income."[648]

Although these categories are descriptively distinct, most of them relate to a "surplus of population", vulnerable to exploitation by those with wealth, willing to use the power of capital to provide employment but also to generate profit and wealth for themselves. For example, Mayhew makes it clear that many small masters only set up as "independent" traders because they had made unemployed through competition in the labour market. Children and women were often forced into the labour market by economic necessity, resulting from poverty and the erosion of domestic industry linked to a surplus of labour. Employers were able to bring labour in from the countryside and from abroad to break the power of unions, and Mayhew wrote in great detail about how real wages and employment fell in the period after the ending of the Napoleonic wars.

Workers were very aware of the factors responsible for the decrease in their wages. One of Mayhew's informants told him: "I believe the reduction of wages in our trade is due chiefly to the

---

647 H. Mayhew, *The Morning Chronicle Survey of Labour and the Poor: the Metropolitan Districts* (Firle 1980), Vol. 1, p. 16.

648 Mayhew, *The Morning Chronicle Survey*, Vol. 1, pp. 16, 17.

supra-abundance of workmen; that is the real cause of our prices having gone down, because when men are scarce, or work is plentiful, they *will* have good wages. From the year 1798 our wages began to increase partly because the number of hands was decreased by war, and partly because foreign orders were much greater than now."[649]

In this situation, where labour supply greatly exceeded its demand, conditions of work became very harsh, enabling employers to extract much more labour from their workers than under previous periods. One of Mayhew's informants working in the carpentry and joinery trade gave the following account of his working conditions:

"I work at what is called the strapping shop ... and have not worked at nothing else for these many years past in London. I call 'strapping', doing as much work as a human being or a horse possibly can in a day ... with the foreman's eyes constantly fixed upon you, from six o'clock in the morning to six o'clock at night. The shop in which I work is for all the world like a prison − the silent system is as strictly carried out there as in a model gaol. If a man was to ask a common question of his neighbour, except it was connected with his trade, he would be discharged there and then. If a journeyman makes the least mistake, he is packed off just the same. A man working in such places is almost always in fear; for the most trifling things he is thrown out in an instant ... I suppose since I knew the trade a man does four times the work he did formerly ..."[650]

No doubt similar conditions could be found in parts of the developing world today, partly resulting from similar kinds of demographic and economic conditions. England was one of the first countries to undergo a demographic transition, with a fall in mortality occurring largely independently of economic change. Modern capitalism first emerged in England, where a surplus of labour was exploited by those owning capital, to protect their own

649 Mayhew, *The Morning Chronicle Survey*, Vol. 1, p. 19.
650 *Ibid,* pp. 17, 18.

standard of living which was threatened by their own increasing numbers.[651]

Changes in the organisation of production − through the enclosure movement in the countryside and the introduction of the "competitive system" in industrial villages and towns − enabled an efficient exploitation of capital resources and labour. Also, as we have seen, the aristocracy and gentry increased their dominance in the army, church, navy, judiciary and civil service, creating pressure on the middle classes to focus more on trading and manufacturing activity, and to exploit their resources and opportunities more effectively.

Conclusion

This essay's main arguments cover a range of complex and difficult issues, but can be summarized in the form of the following hypotheses:

1. Population growth was the result of changes exogenous to the economy, but affected economic development through a range of variables, including increasing prices, a creation of a labour surplus, a fall in labour costs, and a stimulation of demand particularly for goods and services consumed by the rich and wealthy.
2. Population increase was a central variable in the genesis of English capitalism through the creation of 'surplus labour', and had an autonomous influence on economic growth.
3. Population also had a major impact on the social structure of the country:
   a. the growth in the numbers of the aristocracy and gentry led to their dominance of the army, church, navy, judiciary and civil

651 As Chambers and others have pointed out there were multiple reasons why capitalism developed in England before it did elsewhere, including the development of technology, relatively low rates of taxation, the breakdown of monopolies, the deregulation of the economy associated with the erosion of the guild and apprenticeship system, the development of effective legal regulation of property transactions, institutional factors such as the relative lack of political corruption, and the growth of colonialism for the development of overseas trade. See Chambers, *Population, Economy and Society*; D.C. North, *Institutions, Institutional Change and Economic Performance* (Cambridge 1990).

service, as well as creating pressure for the exploitation of capital resources − particularly the ownership of land − leading to the enclosure movement and other innovations in agriculture.

b. the growth in the numbers of the middle classes and their increasing exclusion from major positions of office, led them to focus more forcefully on the development of industrial and commercial enterprise associated with the industrial revolution.

c. the growth of the non-wealth owning population made it vulnerable to economic exploitation, providing the basis of cheap labour which laid the foundation for the industrial and agricultural revolutions.

4. The changes listed under heading three led to an increasing polarisation between the rich and the poor, affecting among other things, patterns in the consumption of goods, the age at marriage, and literacy rates.

5. Although population growth resulted in an increase in poverty amongst the majority of the population in the earlier phases of the industrial revolution, without the improvements in agriculture and manufacturing industry associated with the development of capitalism, England may have suffered the same fate as Ireland, destitution and widespread famine.[652]

652 See Razzell, *Essays in English Population History*, pp. 58-81 for a discussion of these issues.

10. MORTALITY, POPULATION AND POVERTY: A HISTORICAL PERSPECTIVE.[653]

Introduction

The relationship between economic development and population change has long been a matter of controversy.[654] One of the most influential contributors to the debate was Adam Smith, who argued that economic factors acted mainly through the influence of poverty on mortality levels.[655] Malthus emphasized in his theoretical writings the influence of wealth levels on both changing fertility and mortality, although in his empirical work on English population he stressed the role of non-economic factors in reducing mortality.[656] However, although Smith, Malthus and others argued that economic factors had a major influence on all forms of mortality, as we have seen, there is increasing evidence that economic development and wealth had little or no influence on English mortality before the twentieth century.[657]

The main thesis of this book is that exogenous shifts in mortality have had a significant independent influence on population and economic change. A part of this argument focuses on the role of surplus labour, but whereas Marx saw surplus labour as resulting mainly from economic developments, it is viewed here as arising primarily from exogenous demographic change.

The relationship between economics and demography will be considered with respect to the influence of economic development and wealth/ poverty on mortality and population, as

---

653 Written jointly with Christine Spence, and previously unpublished.

654 J. Simon, *Theory of Population and Economic Growth* (Oxford 1986); D. Hodgson, 'Orthodoxy and revisionism in American demography', *Population and Development Review*, Vol. 14 (1988).

655 Smith, *An Inquiry*, Vol. 1, p. 97.

656 T.R. Malthus, *An Essay on the Principal of Population,* Vol. 1 (Cambridge 1989), pp. 15, 71-73, 92, 192-93.

657 Essays 3-5 of the present volume. See also E.A. Wrigley and R. S. Schofield, *The Population History of England 1541-1871* (London 1981), pp. 413-16; E.A. Wrigley, R.S. Davies, J.E. Oeppen and R.S. Schofield, *English Population History from Family Reconstitution, 1580-1837* (Cambridge 1997), pp. 201-204.

well as the effects of health/mortality improvements on population growth and the incidence and distribution of poverty. This two-way interaction of demographic and economic factors will be discussed in the light of both the long-term English historical experience, and that of developing countries in the last sixty years.[658]

There have been a number of previous studies linking population growth with increasing poverty, some of which have emphasized the role of declining mortality.[659] There has been no attempt however to integrate recent research on long-term historical trends with a current analysis of population and poverty in developing countries. The main aim of this essay is to present such a historical perspective, which is important for generating a theoretical and general understanding of the relationship between demographic and economic change, including the long-term genesis of economic inequality and poverty.

I

Poverty, The Decline Of Mortality And The Growth Of Population In Developing Countries.

There is a parallel between the historical demography of England and the demographic experience of third world countries, although the scale and rapidity of falling infant and child mortality was

---

658 Data on economic development and mortality in developing countries although generally available, is subject to a degree of unreliability, particularly on adult mortality. See United Nations, *Health and Mortality: Issues of Global Concern − Proceedings of the Symposium on Health and Mortality, Brussels, 19-22 November 1997* (New York 1999).

659 Malthus discussed extensively the impact of population growth on poverty, but saw this as a part of a systematic long-term cycle involving economic factors. For studies which emphasize the exogenous role of mortality see K. Davis, 'The population spectre: rapidly declining death rate in densely populated countries', *The American Economic Review*, Vol. 46 (1956); J. Kosa, A. Antonovsky and I.K. Zola, *Poverty and Health: a Sociological Analysis* (Cambridge , MA. 1969); M.D. Morris, *Measuring the Condition of the World's Poor: the Physical Quality of Life Index* (New York 1979).

greater in the latter.[660] Developing countries have been able to benefit from some of the medical and other technologies developed elsewhere, partly explaining their more rapid mortality reduction. However, many of the processes responsible for the falls in mortality were similar in both cases.

Population growth in the developing world has largely been due to mortality reductions, much of which occurred as a result of non-economic developments. Preston concluded from a statistical analysis of available data that "factors exogenous to a country's current level of income probably accounted for 75-90 per cent of the growth in life expectancy for the world as a whole between the 1930s and 1960s. Income growth *per se* accounts for only 10-25 per cent."[661]

Wang and colleagues have recently come to a similar conclusion about the relatively unimportant role of per capita income in shaping mortality levels. From a multiple regression analysis of data on 115 middle and low income countries, they concluded that changes in income contributed between 17 and 25 per cent, and education 27 to 41 per cent to the reduction of child and adult mortality in the period 1960-90. They attributed the rest of the decline − between 39 and 50 per cent − to technical factors, including medical and other improvements.[662] Educational and medical improvements require a degree of economic input, but more at the level of public rather than private investment.

Anand and Ravallion ascribed a larger role to growing income in improving life expectancy, but primarily through its indirect effect on other factors. They concluded that two-thirds of increasing life expectancy was due to public health spending, and the rest was a result of a reduction in income poverty. They however heavily qualify this conclusion:

---

660 Combined infant and child mortality amongst the general population fell by approximately 50 per cent between 1750-99 and 1800-49 in Bedfordshire and London, similar to the reductions in many developing countries during the last half-century.

661 S. Preston , 'The changing relation between mortality and level of economic development', *Population Studies*, Vol. 29 (1975).

662 J. Wang, D.T. Jamsion, E. Bos, A. Preker, and J. Peabody, *Measuring Country Performance on Health: Selected Indicators for 115 Countries* (Washington: The World Bank 1999).

"Over the past 10 years, a number of studies have used household or individual level data to look at the determinants of health and educational outcomes in developing countries. Methodologies and data have differed greatly amongst these studies, and the usual estimation problems in micro-econometric work clouds inferences. While some studies predict (say) a positive effect of rising incomes on health, others indicate little or no effect …"[663]

Some of the uncertainty about the factors involved in mortality decline is the result of the poor quality of data. Problems of measurement can be illustrated by changes that the World Bank made in its 2000/01 Development Report to the findings of its previous 1999/00 Report. It revised the 1980-89 and 1990-99 figures for world population increase downwards by about 40%, making varying and different adjustments to individual country data.[664] Given these difficulties, any generalisations about trends in world population and mortality must be qualified by a large degree of uncertainty about the quality of evidence.

However, the majority of research studies suggest a minimal role for increasing per capita GDP in reducing child mortality in developing countries, and this can be illustrated by the following table.

663 S. Anand and M. Ravallion, 'Human development in poor countries: on the role of private incomes and public services', *Journal of Economic Perspectives*, Vol. 7 (1993).

664 P. Svedberg, *Income Distribution Across Countries: How is it Measured and What do the Results Show?* (Institute for International Economic Studies. Stockholm 2001); World Bank, *Entering the 21st Century. World Development Report 1999/00*, (Washington 2000); The World Bank, *Attacking Poverty. World Development Report 2000/01* (Washington 2001).

Table 10.1: GDP Per Capita Annual Growth Rates And The Reduction Of Under Five Mortality In Third World Countries, 1970-2002.[665]

Region	*GDP Per Capita Purchasing Power Parity US$ Billions 2002*	*% GDP Per Capita PPP Annual Growth Rate, 1975-2002*	*Under 5 Mortality Rate Per 1000, 1970*	*Under 5 Mortality Rate Per 1000, 2002*	*% Reduction In Under Five Mortality Rate, 1970-2002*
Latin America & Caribbean	7223	0.7	123	34	72
Central, Eastern Europe & CIS	7192	-1.5	43	22	49
Arab States	5069	0.1	197	62	69
East Asia & Pacific	4768	5.9	122	42	66
South Asia	2658	2.4	206	95	54
Sub-Saharan Africa	1790	-0.8	231	178	23

All regions covered in Table 10.1 experienced significant falls in under-five child mortality, and there appears to have been little relationship between changes in per capita income and mortality reduction. However, there is some association between absolute level of GDP and improvement in child mortality, even when possible complicating factors such as distribution of GDP and the effect of AIDS in Africa and Asia are excluded.[666]

---

665 United Nations Development Programme World Bank, *Attacking Poverty. World Development Report 2000/01* (Washington 2001); United Nations Development Programme. *Cultural Liberty in Today's Diverse World*. *Human Development Report* (New York 2004).

666 UNAIDS, *Report on the Global HIV/AIDS Epidemic* (New York, July 2004).

Much of the reduction in mortality depicted in Table 10.1 is probably due to medical initiatives carried out by local, national and international bodies, including vaccination programmes, the provision of sulfa drugs and antibiotics, re-hydration fluids, improvement in water supplies and public and private hygiene, programmes for the eradication of malaria and other health measures.[667]

Caldwell in a classic paper on routes to low mortality in three relatively poor countries − Sri Lanka, Costa Rica, and Kerala, India − has suggested that there are a number of factors which are important for the reduction of mortality: (1) a substantial degree of female autonomy; (2) an open political system; (3) significant inputs into both health services and education, particularly for female children; (4) health services accessible to all; (5) efficient health services; (6) a nutritional floor particularly for the poor; (7) universal immunization; and (8) antenatal and postnatal health services provided by trained personnel.[668]

Caldwell has argued that countries can take different routes to achieve low mortality,[669] but most of the significant factors identified are not directly related to personal levels of income − with the exception of a minimally adequate level of nutrition, which is clearly important.[670] Most of the factors identified require public health expenditure, and perhaps a degree of income redistribution. Many socialist countries achieved significant reductions in mortality in spite of minimal economic development, and this was largely the result of investment in

667 Preston, 'The changing relation'; J. Caldwell, 'Routes to low mortality in poor countries', *Population and Development Review*, Vol. 12 (1986). For a detailed study of the reduction of mortality brought about mainly by non-economic developments see J.C. Riley, *Poverty and Life Expectancy: The Jamaica Paradox* (Cambridge 2005).

668 Caldwell, 'Routes to low mortality'.

669 *Ibid.*

670 For a discussion of the effect of famine on mortality see T. Dyson and C. O' Grada, *Famine Demography: Perspectives from the Past and Present* (Oxford 2002). The relationship between nutrition and mortality is a very complex one and varies in different historical situations, depending on the incidence of disease and the level of malnutrition. See P.G. Lunn, 'Nutrition, immunity and infection, R. Schofield, D. Reher and A. Bideau (eds.), *The Decline of Mortality in Europe* (Oxford 1991).

medical and other public health services.[671] Cuba is perhaps the most striking example of this approach to achieving low mortality, and today has a very high life expectancy in spite of low personal incomes.[672]

Recently Riley has argued that not all the factors enumerated by Caldwell are necessary for reducing mortality, concluding that "it is difficult to associate the superior achievers [in mortality reduction] with political and civil freedoms …. They represent countries from across the political spectrum."[673] He has also pointed out that many non-socialist countries achieved rapid mortality reductions in the twentieth century, including Jamaica which experienced falls in age-specific mortality of over 50 per cent between 1920-22 and 1949-51 even with a high incidence of poverty.[674] However, Riley concluded that most of the health gains in the period 1920-51 were the result of the actions of individuals making improvements to personal health and hygiene, which were only partly due to the health education campaigns initiated by the colonial administration and various international bodies.[675]

To explore further the relationship between poverty, mortality and population, we have looked at countries with negative per capita gross domestic product annual growth between 1975 and 2002. The following table summarises United Nations data for these countries by two regions − outside and within Sub-Saharan Africa − arranged in order of child mortality reductions between 1970 and 2002.

---

671 Riley, *Poverty and Life Expectancy*, pp. 2-5.

672 United Nations Development Programme, *Cultural Liberty*; Riley, *Poverty and Life Expectancy*, p.4.

673 Riley, *Rising Life Expectancy*, p. 135.

674 *Ibid*, p. 74.

675 *Ibid*, p. 193.

Table 10.2: Mortality, Negative Economic Growth, Health Expenditure And Immunization.[676]

Name of Country	*Increase in Life Expectancy at Birth 1970-2002 (Years)*	*Per Capita Gross Domestic Product PPP Annual Growth Rate, 1975-2002 %*	*Health Expenditure Per Capita PPP US$ 2001*	*One-year-olds fully immunized against measles 2002 %*
Outside Sub-Saharan Africa				
Iraq	4	-9.6	97	90
Latvia	1	-0.5	509	98
Madagascar	5	-1.6	20	61
Djibouti	5	-4.6	90	62
Haiti	1	-2.3	56	53
Moldova	4	-5.4	112	94
Kyrgyzstan	6	-3.6	108	98
Comoros	12	-1.0	29	71
Mean Average Of Eight Countries With The Lowest Mortality Reductions	5	-2.4	128	78
Venezuela	8	-1.0	386	78
Bolivia	17	-0.4	125	79
Nicaragua	14	-2.9	158	98
Iran	15	-0.4	422	99
Peru	14	-0.6	231	95
Kuwait	10	-1.2	612	99
Saudi Arabia	18	-2.5	591	97
United Arab Emirates	13	-2.8	921	94
Mean Average Of Seven Countries With The Highest Mortality Reductions	14	-1.5	431	92

676 United Nations Development Programme, *Cultural Liberty*.

Name of Country	*Increase in Life Expectancy at Birth 1970-2002 (Years)*	*Per Capita Gross Domestic Product PPP Annual Growth Rate, 1975-2002 %*	*Health Expenditure Per Capita PPP US$ 2001*	*One-year-olds fully immunized against measles 2002 %*
Sub-Saharan Africa				
Zambia	-17	-2.1	52	85
Nigeria	8	-0.6	31	40
Rwanda	-5	-0.6	44	69
Angola	2	-1.5	70	74
Burundi	-3	-0.9	19	75
Niger	8	-1.9	22	48
Sierra Leone	-1	-3.3	26	60
Cameroon	1	-0.6	42	62
Mean Average Of Eight Countries With The Lowest Mortality Reductions	-0.9	-1.4	38	64
Cote de Ivoire	-4	-2.0	127	56
Central African Republic	-3	-1.5	58	35
Togo	4	-1.2	45	58
Mali	10	-0.2	30	33
Senegal	11	-0.1	63	54
Namibia	-6	-0.2	342	68
Gambia	16	-0.2	78	90
Mean Average Of Seven Countries With The Highest Mortality Reductions	4	-1.1	106	56

There are a number of factors influencing mortality which are not covered by Table 10.2 − such as war and civil conflict − and no account is taken of distribution of income which is clearly an important factor. The table does show however that in spite of negative per capita income growth between 1975 and 2002 there were substantial gains in life expectancy in most of these countries. Although per capita income growth appears to have had

little influence on mortality, absolute levels of income were important. Countries in the second group spent similar proportions of total GDP on health expenditure as elsewhere − between 4 and 5 per cent − but the absolute amount they invested was significantly greater because of their overall wealth. Their reductions in child mortality and their increasing life expectancy were much higher than in the other countries.

The association between high health expenditure and improved mortality was also found in Sub-Saharan Africa. Most Sub-Saharan African countries have experienced substantial improvements in under-five child mortality even when AIDS, which has affected adults more than children, is taken into consideration,[677]

Table 10.2 also indicates that in spite of falling per capita GDP most of these countries had active medical and vaccination programmes, illustrated by the high rates of immunization against measles. One of the reasons for the reduction in mortality despite growing poverty was the relative cheapness and technical effectiveness of medical and other non-economic public health interventions. For example, the US$ 3 billion spent by the Global Fund to date is only a fraction − 0.005 per cent − of the World's Gross Domestic Product in 2004: US$ 54,562 billion.[678] Nevertheless, the money invested by the World Health Organisation and Non-Governmental-Organisations has been successful in combating infection and disease, as evidenced by the elimination of smallpox in the 1970s.

Medical initiatives are focused and technical, and are likely to be easier to implement than complex economic development programmes, which involve a range of factors, including the rule of law, an absence of political corruption and ready access to capital markets. Countries can achieve spectacular mortality improvements even with very poor economic growth. For example, according to United Nations figures, Saudi Arabia improved its life expectancy by 18 years and reduced its child mortality rate from 185 to 28 per 1000 between 1975 and 2002, in

677 UNAIDS, *Report on the Global HIV/AIDS Epidemic*.

678 International Monetary Fund, *The World Economic Outlook Database* (Washington 2003).

spite of a negative per capita income growth of minus 2.5 per cent per annum.[679]

Saudi Arabia is of course a relatively wealthy country − with a per capita annual income of $12,650 in 2002. However, even in a poor country like Gambia − with a per capita income of only $1,690 − increased its life expectancy by 16 years between 1975 and 2002, and its child mortality rate fell from 319 to 126 per 1000 during the same period. In 1990-2002, 59.3% of Gambia's population lived on less than $1 a day and 82.9% under $2 a day, and the proportion of undernourished people increased from 22% in 1990/92 to 27% in 1999/2001.[680]

All the above figures are of course subject to a large measure of uncertainty because of the unreliability of data. However, the evidence that does exist suggests that major improvements in life expectancy were not simply due to reductions in poverty. It is probable that the significant fall in mortality and the rapidly growing population were largely the result of successful medical interventions and public health programmes. In the absence of economic growth or the re-distribution of income, this is likely to increase unemployment and the growth of poverty.

II

The Influence Of Mortality And Population Change On Poverty Levels In England.

In his introduction to a discussion of the effect of the plague on population levels and the standard of living in the medieval period, Hatcher has summarized the conclusions from his research as follows:

"… the size of the population in later medieval and early Tudor England was one of the major determinants not only of aggregate and *per capita* output, but also of the distribution of wealth and

679 United Nations Development Programme. *Cultural Liberty*.

680 United Nations Development Programme. *Cultural Liberty*.

the structure of society. Just as the abundance of people prior to 1348 played a major part in reducing the standards of living of the peasantry and strengthening the power of landlords, so the progressive shortage of people in the ensuing era played a major part in undermining demesne agriculture and bringing about a fundamental redistribution of wealth. The later fourteenth and fifteenth centuries saw the real wage-rates of craftsmen and labourers apparently reach levels not exceeded until the second half of the nineteenth century. These centuries also experienced one of the most decisive shifts ever in social structure and tenurial relationships, namely the decline of serfdom and customary land tenure."[681]

The exogenous influence of plague on the economy and social structure of medieval England has been widely accepted. Similarly, evidence cited earlier indicates that wealth/poverty played little role in shaping mortality patterns before the middle of the eighteenth century, and that after that date it was probably public health initiatives and medical and other improvements first introduced by the middle and upper classes, which led to the reduction of infant and child mortality.

The relationship between population change and economic development in the early modern period has been summarized by Habakkuk, quoted previously. There is probably a general consensus about the approximate size of population and per capita incomes before 1750, but there has been major disagreement over the standard of living in the period 1750-1850.[682] In one respect the controversy about the standard of living has been misplaced. Population was growing rapidly during the late eighteenth and nineteenth centuries, largely as a result of factors exogenous to economic development. Merely to avoid a decline in real incomes was a major achievement, made possible because of early industrialisation. Population also grew rapidly in Ireland, but unlike England, was unable to avoid famine, and this

681 J. Hatcher, 'Plague, population and the English economy', in M. Anderson (ed.), *British Population History* (Cambridge 1996), pp. 15-60.

682 Harris, 'Public health'.

was partly a result of the absence of industrialisation and a lack of economic development during the same period.[683]

III

Surplus Labour In The Genesis Of Poverty In The Modern World

There are echoes in Habakkuk and Hatcher's work of Marx's analysis of surplus labour. Marx saw this form of labour as essentially linked to economic expropriation, whereas Habakkuk and Hatcher viewed it as originating mainly from exogenous population growth. Marx followed classical economics in seeing demography as a function of economics, and failed to give population an independent role in his general theory of history.[684] However, Habakkuk, Hatcher and Marx came to similar conclusions about economic and social conditions of early capitalism, although they reached these conclusions by different routes. There was a rise in poverty amongst the majority of the population, an increase in capital accumulation amongst the wealthy through their ability to exploit cheap labour, and a general increase in economic and social inequality.

There are parallels with the developing countries listed in Table 10.2. Medical and other interventions have led to a rapid doubling of population within 30 years.[685] In the absence of economic development, it is possible that such rapid population increase will lead to famine and a surge in mortality, as happened in Ethiopia in the 1970s.

However, even in Ethiopia, with its history of extreme poverty and mortality, expectation of life at birth increased by 4 years in the period after the famine. Child mortality reduced from

---

683 This lack of economic development in Ireland was partly the result of economic and other penalties imposed on it by England. See P.E. Razzell, 'Population growth and economic change in eighteenth and early nineteenth century England and Ireland', E.L. Jones and G.E. Mingay (eds.), *Land, Labour and Population in the Industrial Revolution* (London 1967).

684 K. Marx, *Capital: a Critique of Political Economy* (London1987).

685 M. King, 'Health is a sustainable state', *Lancet*, Vol. 336 (1990); J. Jarrett, *Collapse: How Societies Choose to Fail or Survive* (London 2005).

239 per 1000 to 171 per 1000 between 1970-75 and 2000-05 − and with high fertility, its population has increased from 33 to 69 million in the same period.[686]

The following table summarizes data on the relationship between demographic change, economic growth and changes in poverty levels.

Table 10.3: Mortality, Fertility, Population Growth, GDP Growth And Poverty.[687]

Region	*Reduction In Under Five Mortality Rate, 1970-2001* *%*	*Reduction In Fertility Rate, 1970-75 To 2000-05* *%*	*Annual Population Growth Rate, 1975-2001* *%*	*GDP Per Capita PPP Annual Growth Rate, 1975-2001* *%*	*Change In Number Living Below $2 A Day 1981 And 2001* *%*
East Asia & Pacific	66	60	1.4	5.9	-26
Latin America & Caribbean	72	51	1.9	0.7	+30
South Asia	54	41	2.1	2.4	+30
Arab States/ Middle East & North Africa	67	43	2.7	0.3	+34
Sub-Saharan Africa	23	21	2.8	-0.9	+79

The East Asian and Pacific countries − particularly China − have reduced poverty levels in the last twenty years. The factors

686 United Nations Development Programme. *Cultural Liberty*.

687 S. Chen and M. Ravallion, *How Have the World's Poorest Fared since the Early 1980s?* (Development Research Group, New York: World Bank 2004); United Nations Development Programme, *Cultural Liberty*.

responsible for this are complex, but two important factors appear to be successful economic development and a significant reduction in fertility. Other developing countries have been less successful in avoiding poverty, and this may be partly due to lack of international investment and support, together with rapid population growth fuelled by significant falls in mortality and smaller reductions in fertility.

The ecological consequences of population growth are well documented, but the economic and social effects have received less attention. Multi-national companies utilise "surplus labour" derived mainly from population growth, enabling the production of cheap manufactured goods and services for sale in the developed world and elsewhere. In recent years, 37 per cent of foreign direct investment has gone into developing countries, of which 90 percent has been invested in China, India and South-East Asia,[688] where there is not only a major pool of labour, but also a relatively well-educated population working for minimal wages.

These economic developments have probably been associated with a general polarisation of wealth. According to the Human Development Report data, the ratio of income of the poorest 20% to the richest 20% of the world's population has increased from 30 to 1 in 1960 to 59 to 1 in 1989.[689] However, these figures are controversial and there is no current consensus on changes in world income inequality in the period since 1960 to the end of the twentieth century.[690]

If the above overall conclusions are correct, they have general implications for the analysis of demography and its relationship to economics and sociology as disciplines. Most economists have followed Adam Smith and Malthus in assuming that demography is a function of economics, playing at best a very secondary role in economic and social development. Marxist economists and sociologists have attempted to modify this view by stressing the role of "surplus labour" in the growth of capitalism, but they see this surplus resulting mainly from economic development, rather than from exogenous demographic change.

---

688 P. Marfleet, Globalisation and the third world, *International Socialism Journal*, Vol. 81 (1998).

689 United Nations Development Programme, *Global Dimensions of Human Development: Human Development Report, 1992*, (New York).

690 Svedberg, *Income Distribution Across Countries*.

Surplus labour has undoubtedly been a major factor in economic and social change both historically and in the modern world, leading not only to unemployment and poverty, but a range of other problems, including child labour, sexual exploitation and forced migration.

The control of fertility has spread rapidly in developing countries, and if fertility continues to fall, it will lead to a general reduction in population growth, changing the balance of socio-economic forces between capital and labour. However, there is recent evidence that lack of funds for birth control has begun to significantly affect the increases in fertility, particularly in a number of African countries.[691] This could have serious consequences not only for population increase and environmental degradation, but also for the growth of surplus labour and social inequality.

691 See J. Cleland, S. Berstein, A. Faundes, A. Glasier and J. Innis, 'Family planning: the unfinished agenda', *Lancet*, Vol. 368 (2006).

Conclusion

A number of unexpected and new findings have emerged from the research covered by this book, which challenge the current consensus on England's demographic history. Although there are still large areas of uncertainty, provisional evidence suggests the following conclusions:

1. Mortality was the major factor in determining population levels in the period 1550-1850.
2. There was a cyclical pattern of infant and child mortality which approximately doubled between the sixteenth and middle of the eighteenth century, before falling to below its original level in the late eighteenth and early nineteenth century.
3. Levels of infant and child mortality were similar amongst the wealthy and the poor in the sixteenth and seventeenth centuries. A social class gradient only emerged in the middle of the eighteenth century, when infant and child mortality diminished amongst the wealthy several decades before it did in the general population.
4. Adult mortality changed little between the end of the sixteenth century and the beginning of the eighteenth century, when it reduced sharply amongst all socio-economic groups. It diminished mainly in the first half of the eighteenth century, but continued to fall throughout the rest of the century, approximately halving between the beginning and end of the century.
5. Nuptiality and fertility played a minimal role in shaping population levels during the long eighteenth century. There was a rise in the proportion of women never married during the eighteenth century, particularly among the wealthy, but this was probably balanced by a fall in the mean age of marriage amongst the poor.
6. Mortality patterns were significantly influenced by 'place' − disease environment − during the seventeenth, eighteenth and nineteenth centuries.
7. Levels of infant and child mortality were largely shaped by changes in the disease environment, resulting from: i. An increase in the virulence of childhood diseases in the seventeenth and eighteenth centuries; ii. A decrease of mortality from the middle of the eighteenth century onwards due to a range of medical developments and improvements in personal, domestic and public hygiene.

8. The fall in adult mortality levels was independent of socio-economic status, and was probably the result of an autonomous reduction in disease virulence.
9. Population levels mirrored the pattern of mortality change: population increased rapidly in the sixteenth and early seventeenth century, stagnated during the period 1650-1750, and increased and accelerated in the late eighteenth and early nineteenth centuries.
10. Population changes were largely independent of economic developments in the period, and were mainly shaped by exogenous factors.

Economic developments resulting from population change were associated with a polarisation in English society, which led in the early nineteenth century to a growth in class consciousness and political radicalism. Much of this process was fuelled by the growth of "surplus labour" − a surplus that did not result mainly from economic processes, but primarily from an increase of population due to the reduction of mortality. In addition to these changes in English society, there were a number of linked developments, including the growing dominance of positions of power and privilege by the aristocracy and gentry. Other changes resulting from population growth were increasing variations in marriage and consumption patterns between socio-economic groups.

The findings in this book on England's population history are relevant to a number of current ideas in the fields of demography, epidemiology and economic history:
1. The significant increase in infant and child mortality during the eighteenth century coincided with a major reduction of adult mortality. This is at variance with life table models which assume that early and late forms of mortality are mathematically linked.
2. Theories of demographic transition assume a linear decline in mortality, but the cyclical pattern of infant and child mortality indicates that this assumption is incorrect. Demographic transition theory also assumes that reductions in mortality are quickly followed by a decline in fertility, yet the major fall in mortality during the eighteenth and early nineteenth centuries did not result in a general reduction of fertility.

3. Recent theories in epidemiology postulate a cohort association between infant and adult mortality.[692] The lack of an association between these forms of mortality in eighteenth century England raises about questions the general validity of these hypotheses.
4. A number of epidemiologists have argued that there is an intrinsic link between socio-economic status and adult mortality, resulting from status stress and other factors.[693] The absence of a correlation between socio-economic status and adult mortality before the twentieth century suggests that these ideas may not be applicable to historical populations.
5. It is widely assumed that poverty and inadequate nutrition are associated with higher levels of mortality.[694] The evidence in this book suggests there was a minimal association between poverty and infant and child mortality in England before the middle of the eighteenth century, and that adult mortality may have been higher amongst the wealthy than the poor before the twentieth century.
6. There is a current consensus that height not only reflects nutritional levels and the standard of living, but is also a measure of overall health. Available evidence indicates that the wealthy were significantly taller than the poor,[695] and yet adult mortality among the former was at least as great as that among the latter, challenging the assumption of a general link between height and health.
7. The debate about the effects of the industrial revolution on the standard of living has yet to be resolved, but in one respect the debate is misleading. Population probably grew mainly as a result of factors exogenous to the economy, and therefore even to

---

692 See D.J.P. Barker, *Mothers, Babies, and Diseases in Later Life* (London 1994), pp. 1-13; D. Kuh and G. Davey Smith, 'When is mortality risk determined? Historical insights into the current debate', *Social History of Medicine*, Vol. 6 (1993), pp. 101-23.

693 See M. Marmot, *Status Syndrome: How Your Social Standing Directly Affects Your Health* (London 2004); R.G. Wilkinson, *Unhealthy Societies: the Afflictions of Inequality* (London 1996).

694 G. Davey Smith, D. Dorling and M. Shaw (eds.), *Poverty, Inequality and Health in Britain, 1800-2000: A Reader* (Bristol 2001); B. Harris, 'Public health, nutrition, and the decline of mortality: the McKeown thesis revisited', *Social History of Medicine,* Vol. 17 (2004).

695 R. Floud, K. Wachter and A. Gregory, *Height, Health and History: Nutritional Status in the United Kingdom, 1750-1980* (Cambridge 1991).

maintain the overall standard of living was a major achievement during a period − the nineteenth century − when population was doubling every fifty years.

8. The association between life-style − the over-consumption of food, strong alcohol, tobacco and the lack of physical activity − and poor health, has been assumed to be essentially a twentieth century phenomena. Evidence on the life-style and mortality among wealthy families in the period between the seventeen and nineteen centuries indicates that this was not the case.

Demographic factors during the period 1550-1850 were largely shaped by mortality patterns and disease environments. Some of these patterns were influenced by autonomous changes in disease virulence, although after the middle of the eighteenth century, scientific and cultural knowledge about disease became increasingly important. Additionally, the wealthy and educated − strongly influenced by the medical profession − played a leading role in the process of disease prevention.

The demographic and economic developments in the developing world in the last half century or so are similar in some respects to those in England in the eighteenth and nineteenth centuries. The falls in mortality were largely exogenous to economic development, and this was probably also the case in third world countries. The reduction in mortality has occurred even in very poor countries, and, in the absence of economic development or effective policies of income re-distribution, has led to a growth in poverty and inequality.

As in England, the growth of population in developing countries has created a surplus of labour, which has been harnessed by private companies for profit maximisation. This labour surplus has conferred an increasing advantage on those owning capital, a process which is only likely to alter when reductions in fertility stabilize levels of population growth, changing the balance of power between capital and labour, and shaping the long-development of global capitalism.

Bibliography

A Collection of Ordinances and Regulations for the Government of the Royal Household (Society of Antiquaries, London 1790).

Acton, V., *A History of Truro,* Vol. 1 (Truro 1997).

Anand, S., and Ravallion, M., 'Human development in poor countries: on the role of private incomes and public services', *Journal of Economic Perspectives* Vol. 7 (1993).

Annual Reports of the Whitehaven Dispensary, 1783-1804 (Cumbria Record Office, Whitehaven, Ref: YTHOS 2/60).

Antonovsky, A., 'Social class, life expectancy and overall mortality', *The Millbank Memorial Fund Quarterly*, Vol. 45 (1967).

Apprentices of Great Britain (Society of Genealogists Manuscript, London 1921-1928).

Arkell, T., 'An examination of the poll taxes of the later seventeenth century, the Marriage Duty Act and Gregory King', K. Schurer and T. Arkell (eds.), *Surveying the People* (Oxford 1992).

Armstrong, A., *The Population of Victorian and Edwardian Norfolk* (Norwich 2000).

Armytage, G.J., *Allegations for Marriage Licences Issued by the Bishop of London* (Harleian Society, Vol. 24, London 1886).

Armytage, G.J., *Allegations for Marriage Licences Issued by the Bishop of London, 1520-1610* (Harleian Society, Vol. 25, London 1887).

Ashton, T.S., *An Economic History of England in the Eighteenth Century* (London 1955).

Atkinson, A.B., and Bourguignon, F. (eds.), *Handbook of Income Distribution* (Amsterdam 2000).

Austen, J., *The Complete Novels* (Oxford 1994).

Banting, W., *Letter on Corpulence, Addressed to the Public* (London, 1864).

Barker, D.J.P., *Mothers, Babies, and Diseases in Later Life* (London 1994).

Beckett, J.V., 'The decline of the small landowner in England and Wales 1660-1900', F.M.L. Thompson (ed.), *Landowners, Capitalists and Entrepreneurs* (Oxford 1994).

Beier, A.L., 'Engine of manufacture: the trades of London', A.L. Beier and Roger Finlay (eds.), *London 1500-1700: the Making of the Metropolis* (Basingstoke 1986).
Bell, P., *Bedfordshire Wills 1484-1533* (Bedfordshire Historical Record Society), Vol. 76 (1997).
Beresford, J. (ed.), *James Woodforde: the Diary of a Country Parson* (Norwich 1999).
Black, W., *An Arithmetical and Medical Analysis of the Diseases and Mortality of the Human Species* (London 1973).
Blagg, T.M., and Wadsworth, F.A. (eds.), 'Abstracts of Nottinghamshire marriage licences 1577-1700', *British Record Society Index Library*, Vol. 58 (London 1930).
Blagg, T.M., and Wadsworth, F.A. (eds.), 'Abstracts of Nottinghamshire marriage licences 1701-53', *British Record Society Index Library*, Vol. 60 (London 1935).
Blagg, T.M. (ed.), 'Abstracts of the bonds and allegations for Nottinghamshire marriage licences', *Thoroton Society Record Series*, Vol. 10 (Nottingham 1946-47).
Bloch, M., *The Royal Touch* (London 1972).
Boothman, L., 'Letter on Long Melford parish registers', *Local Population Studies,* No. 50 (1993).
Boserup, E., *The Conditions of Agricultural Growth: the Economics of Agrarian Change under Population Pressure* (Chicago 1965).
Boserup, E., *Woman's Role in Economic Development* (New York 1970).
Boserup, E., *Economic and Demographic Relationships in Development* (Baltimore 1990).
Boulton, J., 'The Marriage Duty Act in London', K. Schurer and T. Arkell (eds.), *Surveying the People* (Oxford 1992).
Bowley, A.L., 'Death rates, density, population, and housing', *Journal of the Royal Statistical Society,* Vol. 86 (1923).
Breschi, M., and Pozzi, L. (eds.), *The Determinants of Infant and Child Mortality in Past European Populations* (Udine, 2004).
Brownlee, J., 'The history of birth and death rates in England and Wales taken as a whole from 1570 to the present to the present time', *Public Health,* Vol. 34 (1915-16).
Brunton, D., *Pox Britannica: Smallpox Inoculation in Great Britain, 1721-1830* (Ph.D. Thesis, University of Pennsylvania 1990).

Brunton, D., 'Smallpox inoculation and demographic trends in eighteenth-century Scotland', *Medical History*, Vol. 36 (1992).
Buchan, W., *Domestic Medicine; or the Family Physician,* (Edinburgh 1769).
Buer, M.C., *Health*, *Wealth and Population* (London 1926).
Burger, S.E., and Esrey, S.A., 'Water and sanitation: health and nutrition benefits to children', P. Pinstrup-Anderson, D. Pelletier and H. Alderman (eds.), *Child Growth and Nutrition in Developing Countries* (Ithaca 1995).
Burn, J.S., *The History of Parish Registers in England* (London 1862).
Burnett, J., *Plenty and Want: a Social History of Diet in England from 1815 to the Present Day* (London 1968).
Caldwell, J., 'Routes to low mortality in poor countries', *Population and Development Review,* Vol. 12 (1986).
Camp, A., 'Boyd's London burials and citizens of London', *Family Tree*, Vol. 1 (1985).
Census of England and Wales, 1911, Vol. XIII.
Chadwick, E., *Report on the Sanitary Condition of the Labouring Population of Great Britain* (Edinburgh 1965).
Chambers, J.D., 'Three essays on the population and economy of the Midlands', D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography* (London 1965).
Chambers, J.D., 'The course of population change', D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography* (London 1965).
Chambers, J.D., *Population, Economy and Society in Pre-Industrial England* (Oxford 1972).
Chen, S., and Ravallion, M., *How Have the World's Poorest Fared since the Early 1980s?* (Development Research Group, New York: World Bank 2004).
Cheyne, G., *Practical Rules for the Restoration and Preservation of Health and the Best Means for Invigorating and Prolonging Life* (London 1823).
Cleland, J., Berstein, S., Faundes, A., Glasier, A., and Innis, J., 'Family planning: the unfinished agenda', *Lancet*, Vol. 368 (2006).
Colvin, H.M. (ed.), *The History of the Kings Works*, Vol. 4 (London 1982).

Combe, W., *The English Dance of Death* (London 1815).
Coontz, S.H., *Population Theories and the Economic Interpretation* (London 1979).
Cowper, J.M. (ed), *Canterbury Marriage Licences, 1619-1660* (Canterbury 1894).
Cowper, J.M. (ed.), *Canterbury Marriage Licences, 1661-76* (Canterbury 1896).
Cox, J.C., *The Parish Registers of England* (London 1910).
Creighton, C., *A History of Epidemics in Britain,* 2 Volumes (Cambridge 1965).
Cruickshank, D., and Burton, N., *Life in the Georgian City* (London 1990).
Cunningham, A., and French, R., *The Medical Enlightenment of the Eighteenth Century* (Cambridge 1991).
Danson, J.T., 'Statistical observations relative to the growth of the human body (males) in height and weight, from eighteen to thirty years of age, as illustrated by the records of the borough gaol of Liverpool', *Journal of the Statistical Society of London*, Vol. 23 (1862).
Davey Smith, G., Dorling D., and Shaw M. (eds.), *Poverty, Inequality and Health in Britain, 1800-2000: A Reader* (Bristol 2001).
Davies, D., *The Case of Labourers in Husbandry* (Dublin 1796).
Davis, K., 'The population spectre: rapidly declining death rate in densely populated countries', *The American Economic Review*, Vol. 46 (1956).
De Saussure, C., *A Foreign View of England in 1725-29* (London 1995).
De Vries, J., and Woude, A.M., *The First Modern Economy: Success, Failure, and Perseverance of the Dutch Economy, 1500-1815* (Cambridge 1997).
Dendy, F.W. (ed.), *Extracts from the Records of the Merchant Adventurers of Newcastle-Upon-Tyne* (Surtees Society, Vol. 101, 1899).
Dobson, M., 'The last hiccup of the old demographic regime: population stagnation and decline in late seventeenth and early eighteenth-century south-east England', *Continuity and Change,* Vol. 4 (1989).
Dobson, M., *Contours of Death and Disease in Early Modern England* (Cambridge 1997).
Dr Cliff's Diary (Kent Archives Office Maidstone, P364/28/4).

Drake, M., 'An elementary exercise in parish register demography', *Economic History Review,* Vol. 14 (1961-62).
Drake, M., 'Age at marriage in the pre-industrial West', J, Bechofer (ed.), *Population Growth and the Brain Drain* (Edinburgh 1969).
Drake, M., and Razzell, P.E., *The Decline of Infant Mortality in England and Wales 1871-1948: a Medical Conundrum* (Interim Report to the Wellcome Trust 1999).
Duncan, S.R., Scott, S., and Duncan, C.J., 'The dynamics of smallpox epidemics in Britain, 1550-1800', *Demography,* Vol. 30 (1993).
Dyson, T., and Grada, C.O'., *Famine Demography: Perspectives from the Past and Present* (Oxford 2002).
Eden, F.M., *The State of the Poor*, *or, an History of the Labouring Classes in England from the Conquest to the Present Period,* Vol. 1 (London 1797).
Elliott, V.B., *Mobility and Marriage in Pre-Industrial England* (Cambridge University Ph.D. Thesis, 1978).
Fei, J.C.H. and Ranis, G., *Development of the Labour Surplus Economy: Theory and Policy* (Illinois 1964).
Feinstein, C.H., 'The rise and fall of the Williamson curve', *Journal of Economic History*, Vol. 44 (1988).
Feinstein, C.H., 'Pessimism perpetuated: real wages and the standard of living in Britain during and after the industrial revolution', *Journal of Economic History*, Vol. 58 (1998).
Fenner, F., *Smallpox and Its Eradication* (World Health Organisation, Geneva 1988).
Ficlater, J., 'History and statistics of the sewerage of the Metropolis', *Journal of the Statistical Society*, Vol. 7 (1844).
Fildes, V., *Breasts, Bottles and Babies* (London 1986).
Finlay, R., *Population and Metropolis: the Demography of London, 1580-1650* (Cambridge 1981).
Floud, R., Wachter K. and Gregory A., *Height, Health and History: Nutritional Status in the United Kingdom, 1750-1980* (Cambridge 1991).
Floud, R., and Harris, B., 'Health, height, and welfare: Britain, 1700-1980', R.H. Steckel and R. Floud (eds.), *Health and Welfare during Industrialization* (Chicago 1997).
Fogel, R., 'Second thoughts on the European escape from hunger: famines, price elasticities, entitlements, chronic malnutrition

and mortality rates', S.R. Osmani (ed.), *Nutrition and Poverty* (Oxford 1992).
Fogel, R., *The Escape from Hunger and Premature Death, 1700-2100: Europe, America and the Third World* (Cambridge 2004).
Forbes, T.R., *Chronicle from Aldgate* (New Haven 1971).
Frith, B., (ed.), *Gloucestershire Marriage Allegations, 1637-80* (Bristol 1954).
Galley, C., *The Demography of Early Modern Towns: York in the Sixteenth and Seventeenth Centuries* (Liverpool 1998).
Galton, F., 'The weights of British noblemen during the last three generations', *Nature*, Vol. 17 (1884).
Garrett, E., and Reid, A., 'Thinking of England and taking care: family building strategies and infant mortality in England & Wales, 1891-1911,' *International Journal of Population Geography*, Vol. 1 (1995).
Garrett, E., Reid, A., Szreter, S. and Schurer, K., *Changing Family Size in England and Wales: Place, Class and Demography, 1891-1911* (Cambridge 2001).
Gatley, D.A., (ed.), *The Stoke-upon-Trent Parish Listing, 1701* (Staffordshire Record Society, *Collections for a History of Staffordshire*, 4th Series, Vol. 16, 1994).
G.E.C. The Complete Peerage (London 1910-1959).
General Register Office, *Fifth Annual Report* (Parliamentary Papers 1843/XXI).
General Register Office, *Eighth Annual Report* (Parliamentary Papers 1847-48/XXV).
General Register Office, *Ninth Annual Report (Folio Edition)* (Parliamentary Papers 1847-48/XXV).
General Register Office, *Thirty-Fourth Annual Report* (Parliamentary Papers, 1873).
General Register Office, *Supplement to the Thirty-Fifth Annual Report* (Parliamentary Papers 1875/XVIII).
General Register Office, *Supplement to Sixty-Fifth Annual Report* (Parliamentary Papers 1905/XVIII).
General Register Office, *Seventy-Fourth Annual Report* (Parliamentary Papers, 1912-13/ XIII.)
George, M.D., *London Life in the Eighteenth Century* (London 1925).
Gibson, J., *Bishops Transcripts and Marriage Licences* (Birmingham 1991).

Glass, D.V. (ed.), *London Inhabitants within the Walls* (London 1965).
Glass, D.V., 'Gregory King's estimate of the population of England and Wales, 1695', D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography* (London 1965).
Glass, D.V., 'Two papers on Gregory King', D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography* (London 1965).
Goose, N., and Evans, N., 'Wills as an historical source', T. Arkell, N. Evans and N. Goose (eds.), *When Death Do Us Part* (Oxford 2000).
Griffith, G.T., *Population Problems of the Age of Malthus* (Cambridge 1926).
Guha, S., 'Nutrition, sanitation, hygiene, and the likelihood of death: the British army in India c. 1870-1920', *Population Studies,* Vol. 47 (1993).
Habakkuk, H.J., 'The economic history of modern Britian', D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography* (London 1965).
Habakkuk, H.J., *Marriage, Debt, and the Estate System: English Landownership 1650-1950* (Oxford 1994).
Haines, M.R., 'Socio-economic differentials in infant and child mortality during mortality decline: England and Wales, 1890-1911', *Population Studies*, Vol. 49 (1995).
Haines, R., and Shlomowitz, R., 'Explaining the modern mortality decline: what can we learn from sea voyages?', *Social History of Medicine,* Vol. 11 (1998).
Harrington, J., *A New Discourse of a Stale Subject, Called the Metamorphosis of Ajax* (ed.), E.S. Donne (London 1962).
Harris, B., 'Public health, nutrition, and the decline of mortality: the McKeown thesis revisited', *Social History of Medicine,* Vol. 17 (2004).
Hatcher, J., *Plague, Population and the English Economy, 1348-1530* (London 1977).
Hatcher, J., 'England in the aftermath of the black death', *Past and Present*, Vol. 144 (1994).
Hatcher, J., 'Plague, population and the English economy', in M. Anderson (ed.), *British Population History* (Cambridge 1996).
Hatcher, J., 'Understanding the population history of England 1450-1750', *Past and Present*, Vol. 180 (2003).

Heath, R., *The English Peasant* (London 1893).
Heberden, W., 'Some observations on the scurvy', *Medical Transactions of the Royal College of Physicians*, Vol. 4 (1813).
Hecht, J.J., *The Domestic Servant Class in Eighteenth Century England* (London 1956).
Heintel, M., and Baten, J., 'Smallpox and nutritional status in England, 1770-1873: on the difficulties of estimating historical heights', *Economic History Review,* Volume 51 (1998).
Henry, L., *Manuel de Demographie Historique* (Paris 1967).
Hibbert, C., *The English: a Social History, 1066-1945* (London 1987).
Hodgson, D., 'Orthodoxy and revisionism in American demography', *Population and Development Review,* Vol. 14 (1988).
Hogarth, W., *A Dissertation on Mr Hogarth's Six Prints Lately Published, Viz Gin Lane, Beer Street, and the Four Stages of Cruelty* (London 1751).
Hollingsworth, M.F., and Hollingsworth, T.H., 'Plague mortality rates by age and sex in the parish of St. Botolph's without Bishopsgate, London, 1603' *Population Studies*, Vol. 25 (1971).
Hollingsworth, T.H., 'The demography of the English peerage', *Population Studies,* Supplement, Vol. 18 (1965).
Hollingsworth, T.H., *Historical Demography* (Cambridge 1976).
Hopkins, D.R., *Princes and Peasants: Smallpox in History* (Chicago 1983).
Horrell, S., and Humphries, J., 'Old questions, new data and alternative perspectives: families living standards in the industrial revolution'*, Journal of Economic History*, Vol. 52 (1992).
Houston, R., 'Mortality in early modern Scotland', *Continuity and Change*, Vol. 7 (1992).
Hovenden, R., *The Register of Christenings, Marriages and Burials of the Parish of Allhallow London Wall, 1559-1675* (London 1878).
Hudson, P., 'Industrialization in Britain: the challenge of micro-history', *Family and Community History*, Vol. 2 (1999).
Hughes, P.L., and Larkin, J., *Tudor Royal Proclamations, Volume 1, 1485-1553* (London 1964*)*.

Human Development Reports: 2004 (United Nations Development Programme).
Husbands, C., 'Hearths, wealth and occupations: an exploration of the hearth tax in the later seventeenth century', K. Schurer and T. Arkell (eds.), *Surveying the People* (Local Population Studies, 1992).
Hutcheson, A. B. and Day, A., 'On the rate of mortality prevailing amongst families of the peerage during the nineteenth century', *Journal of the Statistical Society*, Vol. 24 (1863).
'Independent Inquiry into Inequalities in Health (The Acheson Report, 1998)', G. Davey Smith, D. Dorling and M. Shaw (eds.), *Poverty, Inequality and Health in Britain, 1800-2000: A Reader* (Bristol 2001).
International Monetary Fund, *The World Economic Outlook Database* (Washington 2003).
Isherwood, C., *The History of Ampthill* (Ampthill 1921).
Jackson, R.V., 'Inequality of incomes and lifespans in England since 1688', *Economic History Review*, Vol. 47 (1994).
Jarrett, J., *Collapse: How Societies Choose to Fail or Survive* (London 2005).
Johansson, S.R., 'Death and the doctors: medicine and elite mortality in Britain from 1500 to 1800', *Cambridge Group for the History of Population and Social Structure Working Paper Series*, Vol. 7 (1999).
Jones, E.L., and Falkus, M.E., 'Urban improvement and the English economy in the seventeenth and eighteenth centuries', P. Borsy (ed.), *The Eighteenth Century Town: 1688-1820* (London 1990).
Jones, J., 'Counting marriages', *Local Population Studies*, No. 53 (1994).
Jones, P.E., and Judges, A.V., 'London population in the late seventeenth century', *Economic History Review*, Vol. 6 (1935),
Jones, R.E., 'Further evidence on the decline in infant mortality in pre-industrial England: north Shropshire, 1561-1810', *Population Studies*, Vol. 34 (1980).
Kasakoff, A., and Adams, J., 'The effect of migration of ages at vital events: a critique of family reconstitution in historical demography', *European Journal of Population,* Vol. 11 (1995).
King, M., 'Health is a sustainable state', *Lancet*, Vol. 336 (1990).

Komlos, J., 'The birth-baptism interval and the estimate of English population in the eighteenth century', *Research in Economic History*, Vol. 11 (1988).
Komlos, J., 'A Malthusian episode revisited: the height of British and Irish servants in colonial America', *Economic History Review*, Vol. 46 (1993).
Komlos, J., 'Shrinking in a growing economy? The mystery of physical stature during the industrial revolution', *Journal of Economic History*, Vol. 58 (1998).
Komlos, J. and Cinnirella, F., 'European heights in the early 18th century', *Economic and Human Biology*, Vol. 30 (2005).
Kosa, J., Antonovsky, A., and Zola, I.K., *Poverty and Health: a Sociological Analysis* (Cambridge, Massachusetts, 1969).
Krause, J.T., 'The changing adequacy of English registration, 1690-1837', D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography* (London 1965).
Kuh, D., and Davey Smith, G., 'When is mortality risk determined? Historical insights into the current debate', *Social History of Medicine*, Vol. 6 (1993).
Kussmaul, A.S., *Servants in Husbandry in Early Modern England* (Cambridge 1981).
La Rochefoucald, F., *A Frenchman in England in 1784* (London 1995).
Landers, J., 'Mortality and metropolis: the case of London, 1675-1825', *Population Studies,* Vol. 41 (1987).
Landers, J., 'London mortality in the "long eighteenth century": a family reconstitution study', *Medical History*, Supplement No. 11 (1991).
Landers, J., *Death and the Metropolis: Studies in the Demographic History of London* (Cambridge 1993).
Larkin, J.F. (ed.), *Stuart Royal Proclamations,* Vol. 2: *Royal Proclamations of King Charles I, 1626-46* (Oxford 1983).
Larkin, J.F., and Hughes, P.L. (eds.), *Stuart Royal Proclamations, 1: Royal Proclamations of King James I, 1603-25* (Oxford 1973).
Laslett, P., and Harrison, J., 'Clayworth and Cogenhoe', H.E. Bell and R.L. Ollard (eds.), *Historical Essays 1600-1750 Presented to David Ogg* (London 1963).
Latham, R.C., and Matthews, W. (eds.), *The Diary of Samuel Pepys*, 11 Volumes (London 1995).

Le Roy Ladurie, E., 'Un concept de l'unification microbienne du monde (xive-xviie siecles)', *Le Territoire de L'Historien* (Paris 1978).
Lee, R.D. and Lam, D., 'Age distribution adjustments for English censuses, 1821 to 1931', *Population Studies,* Vol. 33 (1983).
Leeson, F., *A Guide to the Records of the British State Tontines and Life Annuities of the 17th and 18th Centuries* (Isle of Wight 1968).
Leridon, H., 'Fecundability and post-partum sterility: an insuperable interaction?', Ronald Gray *et al*. (eds.), *Biomedical and Demographic Determinants of Reproduction* (Oxford 1993).
Leuning, T., and Voth, H.J., 'Smallpox did reduce height: a reply to our critics', *Economic History Review*, Volume 51, (1998).
Leunig, T., and Voth, H.J., 'Smallpox really did reduce height: a reply to Razzell', *Economic History Review,*Vol. 54 (2001).
Leunig, T., and Voth, H.J., 'Comment on "Seat of death and terror"', *Economic History Review,* Vol. 59 (2006).
Lewis, J., '"Tis a misfortune to be a great ladie": Maternal Mortality in the British Aristocracy, 1559-1959', *Journal of British Studies*, Vol. 37 (1998).
Lewis, W.A., 'Economic development and unlimited supplies of labour', *The Manchester School of Economic and Social Studies*, Vol. 22 (1954).
Lindert, P.H., 'English living standards, population growth, and Wrigley-Schofield', *Explorations in Economic History,* Vol. 20 (1983).
Lindert, P.H., 'Unequal English wealth since 1670', *Journal of Political Economy*, Vol. 94 (1986).
Lindert, P.H., 'Who owned Victorian England? The debate over landed wealth and inequality', *Agricultural History*, Vol. 61 (1987).
Lindert, P.H., 'Three centuries of inequality in Britain and America', A.B. Atkinson and F. Bourguignon (eds.), *Handbook of Income Distribution* (Amsterdam 2000).
Lindert, P.H., 'Early inequality and industrialisation: Introduction', *Journal of Income Distribution*, Vol. 9 (2000).
Lindert, P.H., 'When did inequality rise in Britain and America?', *Journal of Income Distribution*, Vol. 9 (2000).

Lindert, P.H., and Williamson, J.G., 'Revising England's social tables, 1688-1812', *Explorations in Economic History*, Vol. 19 (1982).
Lindert, P.H., and Williamson, J.G., 'Reinterpreting Britain's social tables, 1688-1913', *Explorations in Economic History*, Vol. 20 (1983).
Livi Bacci, M., *The Population of Europe* (Oxford 2000).
Lobo, F.M., 'John Haygarth, smallpox and religious dissent in eighteenth-century England', A. Cunningham and R. French (eds.), *The Medical Enlightenment of the Eighteenth Century* (Cambridge 1990).
Loudon, I., *Death in Childbirth: an International Study of Maternal Care and Maternal Mortality, 1800-1950* (Oxford 1992).
Lucas, C., *An Essay On Water* (London 1756).
Lunn, P.G., 'Nutrition, immunity and infection', R. Schofield, D. Reher and A. Bideau, (eds.), *The Decline of Mortality in Europe* (Oxford 1991).
Macleod, D. (ed.), 'Sussex marriage licences for the Archdeaconary of Chichester, 1731-74', *Sussex Record Society*, Vol. 32 (1926).
Macleod, D. (ed.), 'Sussex marriage licences for the Archdeaconary of Chichester, 1775-1800', *Sussex Record Society*, Vol. 35 (1929).
Malthus, T.R., *An Essay on the Principal of Population*, Vols. 1 and 2 (Cambridge 1989).
Marfleet, P., 'Globalisation and the third world', *International Socialism Journal*, Vol. 81 (1998).
Marmot, M., *Status Syndrome*: *How Your Social Standing Directly Affects Your Health* (London 2004).
Marshall, J., *Mortality in the Metropolis* (London 1832).
Marx, K., *Capital: a Critique of Political Economy* (London1987).
Mayhew, H., *London Labour and the London Poor*, 4 Volumes (London 1862).
Mayhew, H., *The Morning Chronicle Survey of Labour and the Poor: the Metropolitan Districts*, 6 Volumes (Firle 1980).
McKeown, T., *The Modern Rise of Population* (London 1976).
McKeown, T., and Brown, R.G., 'Medical evidence related to English population change in the eighteenth century', *Population Studies*, Vol. 9 (1955).

McKeown, T., and Record, R.G., 'Reasons for the decline in mortality in England and Wales during the nineteenth century', *Population Studies*, Vol. 16 (1962).
Mercer, A., *Disease, Mortality and Population in Transition* (Leicester 1990).
Misson, M., *Memoirs and Observations in His Travels over England* (London 1719).
Mitchell, B.R., and Deane, P., *Abstracts of British Historical Statistics* (Cambridge 1976).
Mokyr, J., and O'Grada, C., 'Famine disease and famine mortality lessons from the Irish experience, 1845-50', T. Dyson and C. O'Grada (eds.), *Famine Demography: Perspectives from the Past and Present* (Oxford 2002).
Moody, J., *The Great Burford Smallpox Outbreak of 1758* (Burford 1998).
Morris, M.D., *Measuring the condition of the World's Poor: the physical quality of life index* (New York 1979).
Murray, V., *High Society: a Social History of the Regency Period, 1788-1830* (London 1998).
Neild, W., 'Comparative statement of the income and expenditure of certain families of the working classes in Manchester and Dukinfield in the years 1836 and 1841', *Journal of the Statistical Society of London*, Vol. 4 (1841).
Neison, F.G.P., *Contributions to Vital Statistics* (London 1864).
North, D.C., *Institutions, Institutional Change and Economic Performance* (Cambridge 1990).
Oldstone, M.B.A., *Viruses, Plagues and History* (Oxford 1998).
Omran, A.R., 'The epidemiologic transition theory. A preliminary update', *Journal of Tropical Pediatrics*, Vol. 29 (1983).
Oppe, A.P., *Thomas Rowlandson: His Drawings and Water-Colours* (London 1923).
Osmani, S.R. (ed.), *Nutrition and Poverty* (Oxford 1992).
Oxley, D., '"The seat of death and terror": urbanization, stunting, and smallpox', *Economic History Review*, Vol. 56 (2003).
Oxley, D., '"Pitted but not pitied" or, does smallpox make you small', *Economic History Review*, Vol. 59 (2006).
Penfold, E.W.D. (ed.), 'Calendar of Sussex marriage licences … for the Archdeaconary of Lewes, 1772-1837', *Sussex Record Society*, Vol. 25 (1917).

Penfold, F.W.D. (ed.), 'Sussex marriage licences for the Archdeaconary of Lewes, 1772-1837', *Sussex Record Society*, Vols. 25 and 26 (1917 and 1919).
Picard, L., *Restoration London* (London 1997).
Pitkanen, K.J., Mielke, J.H., and Jorde, L.B., 'Smallpox and its eradication in Finland: implications for disease control', *Population Studies,* Vol. 43 (1989).
Place, F., *Illustrations and Proofs of the Principles of Population* (London 1930).
Poole, H.E., *The Wisdom of Andrew Boorde* (Leicester 1936).
Porter, R., 'Cleaning up the Great Wen: public health in eighteenth century London', W.F. Bynum and R. Porter (eds.), *Living and Dying in London* (*Medical History*, Supplement No. 11, London 1991).
Porter, R., (ed.), *George Cheyne: the English Malady, 1733* (London 1991).
Porter, S., *The Great Plague* (Stroud 1999).
Powicke, F.J. (ed.), *Richard Baxter's the Poor Husbandman's Advocate to Rich Racking Landlords* (London 1926).
Preston, S.H., 'The changing relation between mortality and level of economic development', *Population Studies*, Vol. 29 (1975).
Rashad, H.R., Gray, R., and Boerma, T., *Evaluation of the Impact of Health Interventions* (International Union for the Scientific Study of Population, Belgium 1995).
Razzell, P.E., 'Social origins of officers in the Indian and British home army: 1758-1962', *British Journal of Sociology*, Vol. 14 (1963).
Razzell, P.E., 'Population growth and economic change in eighteenth and early nineteenth century England and Ireland', E.L. Jones and G.E. Mingay (eds.), *Land, Labour and Population in the Industrial Revolution* (London 1967).
Razzell, P.E., *Essays in English Population History* (London 1994).
Razzell, P.E., 'Did smallpox reduce height?', *Economic History Review*, Volume 51 (1998).
Razzell, P.E., 'Did smallpox reduce height?: a final comment', *Economic History Review*, Vol. 54, (2001).
Razzell, P.E., *The Conquest of Smallpox* (London 2003).

Razzell, P.E., 'Life and death in Bedfordshire: early research findings', *Bedfordshire Family History Society Journal,* Vol. 15 (2005).

Razzell, P.E., and Wainwright, R.W., (eds.), *The Victorian Working Class: Selections from Letters to the Morning Chronicle* (London 1973).

Razzell, P.E., Garrett, E., and Davies, R., *The Sociological Study of Fertility and Mortality in Ipswich 1872-1881* (Report submitted to the Economic & Social Research Council 2001).

Razzell, P.E., and Spence, C., 'Poverty or disease environment? The history of mortality in Britain, 1500-1950', M. Breschi and L. Pozzi (eds.), *The Determinants of Infant and Child Mortality in Past European Populations* (Udine, 2004).

Razzell, P.E., and Spence, C., 'The history of infant, child and adult mortality in London, 1550-1850', *The London Journal* (2007, Forthcoming).

Reddaway, T.F., *The Rebuilding of London* (London 1940).

Report of the Select Committee on Parochial Registration (Parliamentary Papers, 1833/ XIV).

Riley, J.C., *The Eighteenth Century Campaign to Avoid Disease* (Basingstoke 1987).

Riley, J.C., *Rising Life Expectancy: a Global History* (Cambridge 2001).

Rowntree, B.S., *Poverty: A Study of Town Life* (London 1901).

Ruggles, S., 'Migration, marriage, and mortality: correcting sources of bias in English family reconstitutions', *Population Studies*, Vol. 4 (1992).

Rutten, W., 'Smallpox, subfecundity, and sterility: a case study from a nineteenth-century Dutch municipality', *Social History of Medicine*, Vol. 6 (1993).

Saah, A.J., 'Rickettsia prowazekii (epidemic louse-borne typhus)', G.L. Mandell, J.E. Bennett and R. Dolin (eds.), *Principles and Practice of Infectious Diseases,* Vol. 2 (Philadelphia 2000).

Schofield, J., *The London Surveys of Ralph Tresswell* (London 1987).

Schofield, R.S., 'The geographical distribution of wealth in England, 1334-1649', *Economic History Review*, Vol. 18, (1965).

Schofield, R.S., 'Representativeness and family reconstitution', *Annales De Demographie Historique* (Paris 1972).

Schofield, R.S., and Berry, B.M., 'Age at baptism in pre-industrial England', *Population Studies*, Vol. 25 (1971).
Scott, S., and Duncan, C.J., *Human Demography and Disease* (Cambridge 1998).
Seebohm Rowntree, B., *Poverty: A Study of Town Life* (London 1901).
Shaw, C., *When I Was a Child* (Firle 1980).
Shaw, L.M., (ed.), *Nottinghamshire Marriage Bonds, 1791-1800* (Nottingham 1987).
Short, T., *A Dictionary Concerning the Causes and Effects of Corpulency* (London 1727).
Simon, J., *Theory of Population and Economic Growth* (Oxford 1986).
Simon, J., 'Introduction', J. Simon (ed.), *The Economics of Population: Key Modern Writings,* Vol. 1 (Cheltenham 1997).
Sinclair, J., *The Code of Health and Longevity* (London, 1833).
Skold, P., *The Two Faces of Smallpox* (Umea 1996).
Smiles, S., *Thrift* (London 1905).
Smith, A., *An Inquiry into the Nature and Causes of the Wealth of Nations,* Vol. 1 (Oxford 1976).
Smith, J.R., *The Speckled Monster* (Chelmsford 1987).
Smith, V., *Cleanliness in the Development of Idea and Practice in Britain, 1770-1850* (Ph.D. thesis, London School of Economics, June 1985).
Snell, K.D.M., *Annals of the Labouring Poor* (Cambridge 1987).
Soltow, L.C., 'Long-run changes in British income inequality', *Economic History Review*, Vol. 21 (1968).
Souden, D., *Pre-Industrial English Migration Fields* (University of Cambridge Ph.D. Thesis 1981).
Steel, D.J., *General Sources of Births, Marriages and Deaths before 1837* (National Index of Parish Registers, Vol. 1, 1968).
Stone, L., 'Literacy and education in England, 1640-1900', *Past and Present*, Vol. 42 (1962).
Stow, J., *A Survey of the Cities of London and Westminster*, (ed., J. Strype, London 1720).
Stuart, J., and Wells, P., (eds.), *The Index of Bedfordshire Probate Records 1484-1858*, Vol. 1 (The Index Library, British Record Society, 1993).
Surrey Archaelogical Collections, Vol. 27 (1914).

Svedberg, P., *Income Distribution Across Countries: How is it Measured and What do the Results Show?* (Institute for International Economic Studies, Stockholm 2001).
Szreter, S., and Mooney, G., 'Urbanization, mortality and the standard of living debate: new estimates of the expectation of life at birth in nineteenth-century British cities', *Economic History Review,* Vol. 51 (1998).
Tanner, J.M., *A History of the Study of Human Growth* (Cambridge 1981).
Tate, W.E., *The Parish Chest* (Cambridge 1969).
Thurley, S., *The Royal Palaces of Tudor England* (Yale 1993).
Tryon, T., *The Way to Health, Long Life and Happiness* (London 1683).
UNAIDS, *Report on the Global HIV/AIDS Epidemic* (New York, July 2004).
United Nations, *Health and Mortality: Issues of Global Concern − Proceedings of the Symposium on Health and Mortality, Brussels, 19-22 November 1997* (New York 1999).
United Nations Development Programme, *Global Dimensions of Human Development: Human Development Report, 1992*, (New York).
United Nations Development Programme. *Cultural Liberty in Today's Diverse World*. *Human Development Report* (New York 2004).
United Nations Development Programme World Bank, *Attacking Poverty*. *World Development Report 2000/01* (Washington 2001).
Van Der Woude, A.M., 'Population developments in the northern Netherlands (1500-1800) and the validity of the "urban graveyard" effect', *Annales De Demographie* (1982).
Vann, R.T., and Eversley, D.E.C., *Friends in Life and Death* (Cambridge 1992).
Vicar-General's Marriage Licences, 1660-1851 (Manuscript, Lambeth Palace Library).
Voth, H.J., and Leunig, T., "Did smallpox reduce height?: stature and the standard of living in London, 1770-1873", *Economic History Review*, Vol. 49, (1996).
Wadd, W., *Comments on Corpulency* (London 1829).
Wang, J., Jamsion, D.T., Bos, E., Preker, A., and Peabody, J., *Measuring Country Performance on Health: Selected*

Indicators for 115 Countries (Washington: The World Bank 1999).
Ward, J.E., 'Death in eighteenth century Whitehaven: the mortality records from Holy Trinity Church', *Transactions of the Cumberland & Westmorland Antiquarian & Archaelogical Society,* Vol. 98 (1998).
Webb, C., *London Apprentices* (London 1996-98).
Webb, C., (ed.), *London Bawdy Courts*, *1703-13* (London 1999).
Webb, C. (ed), *London Apprentices: Volume 27, Masons' Company 1663-1805* (London 1999).
Weinreb, B. and Hibbert, C., *The London Encyclopedia* (London 1983).
Weir, A., *Britain's Royal Families* (London 1994).
Weir, A., *Elizabeth the Queen* (London 1998).
Wilkinson, R.G., 'Class mortality differentials, income distribution and trends in poverty 1921-1981', *Journal of Social Policy*, Vol. 18 (1989).
Wilkinson, R.G., *Unhealthy Societies: the Afflictions of Inequality* (London 1996).
Wilkinson, R.G., 'Health inequalities: relative or absolute material standards?' *British Medical Journal,* Vol. 314 (1997).
Williams, N., *The Royal Residences of Great Britain: a Social History* (London 1960).
Williams, N., 'Death in its season: class, environment and the mortality of infants in nineteenth century Sheffield', *Social History of Medicine,* Vol. 5 (1992).
Williams, N. and Galley, C., 'Urban-rural differentials in Victorian England', *Population Studies*, Vol. 49 (1995).
Williamson, J.G., 'Earnings inequality in nineteenth century Britain', *Journal of Economic History*, Vol. 40 (1980).
Williamson, J.G., *Did British Capitalism Breed Inequality?* (Boston 1985).
Willis, A.J., (ed.), *Canterbury Marriage Licences, 1810-37* (Chichester 1971).
Wilson, A., 'The politics of medical improvement in early Hanoverian London,' A. Cunningham and R. French (eds.), *The Medical Enlightenment of the Eighteenth Century* (Cambridge 1991).
Woodforde, J., *Diary of a Country Parson*, 5 Volumes (Oxford 1924-31).

Woods, R., *The Demography of Victorian England and Wales* (Cambridge 2000).
Woods, R., and Williams, N., 'Must the gap widen before it can be narrowed? Long-term trends in social class mortality differentials', *Continuity and Change*, Vol. 10 (1995).
World Bank, *Entering the 21st Century* (World Development Report 1999/2000, Washington 2000).
World Bank, *Attacking Poverty* (World Development Report 2000/01, Washington 2001).
Wrigley, E.A., 'Some problems of family reconstitution using English parish registers: the example of Colyton', *Proceedings of the Third International Conference of Economic History*, Munich 1965, Section VII, Demography And Economics (Paris 1972).
Wrigley, E.A., 'The effect of migration on the estimation of marriage age in family reconstitution studies', *Population Studies*, Vol. 48 (1994).
Wrigley, E.A., 'How reliable is our knowledge of the demographic characteristics of the English population in the early modern period?', *The Historical Journal* ,Vol. 40 (1997).
Wrigley, E.A., and Schofield, R.S., *The Population History of England, 1541-1871* (London 1981).
Wrigley, E.A., Davies, R.S., Oeppen, J.E. and Schofield, R.S., *English Population History from Family Reconstitution 1580-1837* (Cambridge 1997).
Zinsser, H., *Rats, Lice and History* (New York 1963).

Name and Place Index

Ackworth, Yorkshire 105, 109, 179, 181, 190
Acton, V. 96
Addingham, Yorkshire 179, 181
Adel, Yorkshire 179, 181
Alcester, Warwickshire 69
Aldenham, Hertfordshire 9, 15, 51, 69
Ampthill, Bedfordshire 34, 35, 75, 76, 95-97, 105, 109, 110, 112, 155, 202
Anand, S. 255, 256
Angola 261
Antonovsky, A. 254
Ardleigh, Essex 129, 130
Arkell, T. 14, 20, 31, 101
Armstrong, A. 148
Armytage, G.J. 80
Arsley, Bedfordshire 202
Ash, Kent 69
Ashton, T.S. 246
Askham Bryan, Yorkshire 179
Aspley Guise, Bedfordshire 202
Astley, Warwickshire 129, 130
Austen, J. 120, 183
Austrey, Warwickshire 9, 51, 52, 69, 71
Aynho, Northamptonshire 97, 177, 180, 181, 185-186
Barton in the Clay, Bedfordshire 25-27
Bailey Hutcheson, A. 199
Banbury, Oxfordshire 69, 179
Banting, W. 212
Baptists 34, 35
Barker, D.J.P. 273
Basingstoke, Hampshire 179
Baten, J. 192
Batten, W. 159
Baxter, R. 206, 207
Bedford 34, 35
Bedford St. Mary 25-27, 202
Bedford St. Pauls 105, 202
Bedfordshire 11, 23, 24-29, 34, 35, 73-75, 99, 101, 105, 109, 112, 130, 132, 133, 135, 138-140, 179, 201-203, 255
Bedfordshire Family History Society 24, 25, 34
Beier, A.L. 247
Beresford, J. 209, 224

Berkshire 30, 101, 180, 183
Biggleswade, Bedfordshire 34, 35, 202
Birstall, Yorkshire 178, 179
Black, W. 209
Blagg, T.M. 82, 116, 128
Bletsoe, Bedfordshire 28
Bloch, M. 155
Blunham, Bedfordshire 34, 202
Boerma, T. 197
Bolivia 260
Boorde, A. 151, 152, 160, 161, 165
Borsay, P. 122
Boserup, E. 229, 230
Bottesford, Lincolnshire 69, 71
Boutlon, J. 13, 14, 20, 32, 33,
Bowley, A.L. 93
Boyd, P. 11, 13-15, 134
Braithwell, Yorkshire 179, 181
Breamore, Hampshire 95, 99, 109, 112, 180, 182
Breschi, M. 89, 98
Bridford, Dorset 9, 15, 51, 69, 71
Brighton, Sussex 182
Brington, Northamptonshire 36
Bristol 94, 108
British Journal of Sociology 236
British Medical Journal 197
Brown, R.G. 89
Brownlee, J. 126
Brunton, D. 184, 187, 188
Buchan, W. 208, 209
Buckinghamshire 101
Buer, M.C. 148, 174
Burford, Oxfordshire 97, 180, 181, 187
Burger, S.E. 142
Burhwalis, Yorkshire 179, 181
Burn, J.S. 36, 37
Burnett, J. 205, 206, 218
Burton, N. 169
Burundi 261
Bury St. Edmunds, Suffolk 180
Buxton, G. 224
Caldwell, J. v, 258, 259
Calne, Wiltshire 179
Cambridge Group 5, 9, 10, 15, 16, 20, 30, 43-47, 49, 50, 53, 55, 57-60, 63, 64, 67-70, 72, 75, 77-79, 86, 90, 109, 110, 126, 129, 134, 139

Cambridgeshire 99, 101, 105, 109, 112
Cameroon 261
Camp, A. 11
Canewdon, Essex 7, 95, 99, 109, 112
Canterbury, Kent 61, 75, 76, 129, 131, 237
Cardington, Bedfordshire 129, 130
Carlisle, Cumberland 178-181
Carlton, Yorkshire 179, 181
Carroll, P. 73
Cattistock, Dorset 112
Central African Republic 261
Chadwick, E. 118, 197, 205, 220, 223
Chalgrave, Bedfordshire 25-27
Chambers, J.D. xvii, xviii, 125, 200, 229, 230, 238, 242, 250
Charles I 153-155
Charles II 153-155, 161
Chelmsford, Essex 182, 194
Chen, S. 266
Cheshire 101, 178
Chester, Cheshire 178-181, 183
Cheyne, G. 207, 208
Chilvers Coton, Warwickshire 66, 129, 130
China 266, 267
Clarke, Dr T. 163, 164
Clayworth, Nottinghamshire 10, 73, 105
Cleland, J. v, 268
Clifton, Bedfordshire 202
Clophill, Bedfordshire 202
Cogenhoe, Northamptonshire 73
Colmsworth, Bedfordshire 202
Colne Engaine, Essex 182
Colvin, H.M. 152
Colyton, Devon 9, 15, 30, 48, 52, 69
Comoros 260
Continuity and Change 118, 140
Cooper, W.D. 37
Corfe Castle, Dorset 129, 130
Cork, Ireland 94, 108
Cornwall 101-103, 109, 111, 112, 179
Costa Rica 258
Cote de Ivoire 261
Cowper, J.M. 61,131
Cox, J.C. 36
Cranfield, Bedfordshire 34, 202
Creighton, C. 140, 141, 178, 181, 185

Cruikshank, D 169
Cuba 259
Cumberland 101, 178, 179
Cunningham, A. 155, 176, 194
Cusop, Herefordshire 95, 99, 109, 112
Cuxham, Oxfordshire 180, 184
Danson, J.T. 211
Davey Smith, G. 197, 205, 273
Davies, D. 215, 219
Davies, R.S. 6, 43, 44, 113, 203, 253
Davies, T. 194
Davis, K. 254
Dawlish, Devon 9, 15, 69
Day, A. 199
De Saussure, C. 141
De Vries, J. 144
Deane, P. 129, 142, 218, 246
Dedham, Suffolk 193
Devon 22, 30, 101, 130
Djibouti 260
Dobson, M. 96, 100, 110, 120, 139-141, 174, 224, 225
Dorling, D. 197, 273
Dorset 10, 20, 21, 23, 30, 97, 101, 103, 104, 112, 130
Drake, M. v, 75, 113, 178, 243, 245
Dublin 94, 108
Duckett Family 7, 8
Duckett, M. 7
Duckett, T. 7
Dukinfield, Lancashire 215
Duncan, C.J. 177, 178
Duncan, S.R. 177
Dunstable, Bedfordshire 25-27, 202
Durham 101
Dyson, T. 258
Earsdon, Northumberland 52, 69
East Hoathley, Sussex 8
Eaton Hastings, Oxfordshire 95, 99, 109
Eaton Socon, Bedfordshire 202
Eccleshall, Staffordshire 15
Economic History Review 12, 101, 191, 192, 232-234
Eden, F.M. 215, 219
Elizabeth I 149-151, 154
Elliott, V. 61
Elstow, Bedfordshire 74, 96, 112, 134
Erasmus, D. 150
Esrey, A.A. 142

Essex 7, 30, 56, 99, 101, 109, 112, 130, 180, 182
Ethiopia 265
Evans, N. 31
Eversley, D.E.C. xvii, 3, 47, 81, 93, 94, 108, 125, 140, 141, 200, 229
Falkus, M.E. 121, 122, 171
Farr, W. 71, 92, 199, 201, 220, 223
Fei, J.C.H. 235, 236
Feinstein, C.H. 231, 234
Fenner, F. 186
Fildes, V. 156
Finland 178
Finlay, R. 6, 14, 135, 247
Flitton, Bedfordshire 202
Floud, R. v, 211, 231, 273
Fogel, R. 210, 211, 277
Folkestone, Kent 31, 32
Forbes, T.R. 135, 140
Framfield, Sussex 8
Francois, P. 73
French, R. 155, 176, 194
Friends House Library 94, 108
Frith, B. 62, 63
Galley, C. 77, 139
Galton, F. 210, 211
Gambia 261, 263
Garrett, E. v, 89, 113, 148, 199, 203
Gatley, D.A. 131
Gedling, Nottinghamshire 69
Genealogists' Magazine 7, 10
General Register Office 113, 119, 136, 137, 192, 193, 197
Gentleman's Magazine 36, 195
George, M.D. 125, 148
Gibson, J. 62
Glass, D.V. xvii, 3, 10-15, 47, 125, 132, 200, 229
Gloucestershire 62, 63, 101, 242
Glynde, Sussex 194
Godalming, Surrey 97, 177, 179
Goodnestone, Kent 10
Goose, N. 31
Gray, R. 197
Great Barford, Bedfordshire 28
Great Dunmow, Essex 30
Great Oakley, Essex 69, 71
Great Shefford, Berkshire 180
Greenwich, Kent 62, 63, 136, 151, 152, 161
Griffith, G.T. 125, 148
Grownow 225

Guha, S. 121, 142, 173
Haines, M.R. 115
Haines, R. 121, 142, 173
Haiti 260
Halifax, Yorkshire 181, 243
Hampshire 10, 97, 99, 101, 109, 112, 130, 179, 180, 182
Harrington, J. 153
Harris, B. v, 197, 205, 231, 232, 264, 273
Harrison, J. 73
Harrold, Bedfordshire 202
Hartland, Devon 9, 15, 30, 52, 69
Hatcher, J. 140, 229-231, 263-265
Haygarth, J. 178, 182, 183, 194
Heath, R. 205, 212, 213, 216
Hecht, J.J. 122, 173
Heintel, M. 192
Henlow, Bedfordshire 25-27, 202
Henry VIII 149, 150, 155
Henry, L. 6
Hentzner, P. 150
Herefordshire 99, 101, 109, 112
Hertfordshire 101
Heslington, Yorkshire 179, 181
Hibbert, C. 134, 219
Hickleton, Yorkshire 179
Higham Gobion, Bedfordshire 202
Hindley, Lancashire 179
Highworth, Wiltshire 105
Hinde, A. v, 23,
Hindley, Lancashire 179, 188-190
Historical Journal 57
Hockliffe, Bedfordshire 34, 35
Hodgson, D. 125, 253
Hogarth, W. 214
Holland 144, 168, 192
Hollingsworth, M.F. 135
Hollingsworth, T.H. 44, 49, 90, 118, 135, 198, 236, 237, 239, 240, 242
Holwell, Bedfordshire 202
Hopkins, D.R. 188
Horrell, S. 234
Horton Kerbie, Kent 180, 182
Houghton Conquest, Bedfordshire 202
Houghton Regis, Bedfordshire 25-27, 34, 35, 202
Houston, R. 118
Hovenden, R. 135
Hudson, P. 245
Hughes, P.L. 152, 153, 155

Humphries, J. 234
Husbands, C. 101
Husborne Crawley, Bedfordshire 25-27
Huntingdonshire 101
India 121, 142, 174, 236, 258, 267
Ipplepen, Devon 69
Ipswich, Suffolk 75, 76, 113, 114, 203, 204
Iraq 260
Iran 260
Ireland 94, 108, 251, 264, 265
Isherwood, C. 96
Jackson, R.V. 234
Jarrett, J. 265
Johansson, S.R. 90, 102, 148
Jones, E.L. 121, 122, 171, 265
Jones, J. 63
Jones, P. E. 11, 12
Jones, R.E. 3,
Journal of Economic History 231, 233, 234
Journal of the Statistical Society 171, 199, 211, 215
Judges, A.V. 11, 12
Kemerton, Shropshire 95
Kempston, Bedfordshire 202
Kent 10, 31, 36, 61-64, 66, 79-81, 83-85, 101, 105, 109, 112, 115-117, 129-131, 179-183, 200
Kerala, India 258
Keysoe, Bedfordshire 202
Kilmarnock, Scotland 178, 179
King, G. 12, 20, 47, 234
King, J. 182
King, M. 265
Komlos, J. 69, 231-233
Kosa, J. 254
Krause, J. T. 3, 16
Kuh, D. 273
Kuwait 260
Kyrgyzstan 260
La Rochefoucald, F. 209, 210, 214
Lam, D. 45
Lancashire 84, 101, 178, 179, 188, 189, 247
Landers, J. v, 15, 83, 76, 83, 98, 102, 108, 135, 137, 180
Langford, Bedfordshire 202
Larkin, J. 152-155, 162
Laslett, P. 73
Latham, R. 147, 159-168, 224
Latvia 260
Le Roy Ladurie, E. 140

Lee, R.D. 45
Leeson, F. 118
Leighton Buzzard, Bedfordshire 34, 35, 202
Leridon, H. 55
Leunig,T. 191, 192, 233
Lewes, Sussex 37, 116, 243, 244
Lewis, J. 225
Lewis, W.A. 235
Leridon, H. 55
Lichfield, Staffordshire 10, 65, 129-131
Limerick, Ireland 94, 108
Lincolnshire 101
Lindert, P. 45-46, 231, 233-235
Little Barford, Bedfordshire 28,
Little Staughton, Bedfordshire 34, 35
Liverpool 137, 138, 211
Livi Bacci, M. v, 141, 143, 144
Lobo, F.M. 194
Local Population Studies 3, 19, 31, 63, 101
London 10-16, 20, 61, 62, 64, 75, 76, 79-81, 83, 84, 93-96, 98, 100-104, 106-110, 112, 119-122, 125, 129, 130, 132, 134-142, 148, 152-159, 161, 164, 166, 168-173, 175, 180, 191-193, 199-201, 205, 207, 210, 214, 247-249, 255
London Journal 76, 110
Long Melford, Suffolk 30, 31
Loudon, I. 225
Lower Gravenhurst, Bedfordshire 202
Lunn, P.G. 197, 205, 258
Luton, Bedfordshire 34, 202
Lyme Regis, Dorset 10, 20-23, 29, 30, 39, 103, 104
Macleod, D. 83, 116, 127, 243
Madagascer 260
Madras, India 185, 186
Mali 261
Malthus, T.R. xviii, 44, 89, 125, 148, 172, 229, 232, 233, 235, 240-242, 245-247, 253, 254, 267
Manchester 84, 178, 179, 180, 181, 215, 235
March, Berkshire 15
Marfleet, P. 267
Marine Society 191
Marmot, M. 197, 226, 273
Marshall, J. 15, 110
Marx, K. xviii, 125, 235, 253, 265, 267
Matthews, L.G. 150
Matthews, W. 147, 159-168, 224

Maulden, Bedfordshire 25-27, 34, 35,
Mayhew, H. 170, 171, 247-249
McKeown, T. 89, 90, 92, 120, 132, 177, 197, 205, 273
Medical History 108, 137, 142, 169, 184
Melbourne, Derbyshire 10
Mercer, A. 188
Middlesex 101
Mielke, J.H. 178
Milton Bryant, Bedfordshire 26, 27
Milton Ernest, Bedfordshire 140
Misson, M. 154
Mitchell, B.R. 129, 142, 218, 246
Moldova 260
Monro, A. 178, 183
Moody, J. 97, 181, 187
Moravians 34, 35
Morchard Bishop, Devon 69
Morris, M.D. 254
Murray, V. 224, 225
Namibia 261
Neison, F.G.P. 118, 220-223
Nettleton, T. 181
New Romney, Kent 10
Newbury, Berkshire 30
Newcastle-On-Tyne 84, 85, 87
Newton Reigny, Cumberland 178, 179
Nicaragua 260
Niger 261
Nigeria 261
Norfolk 101, 148
Northampton 110
Northamptonshire 36, 97, 101, 177, 180, 181, 185, 194
Northill, Bedfordshire 202
Northumberland 101
Norwich, Norfolk 75, 76, 94, 108
Nottinghamshire 10, 64, 73, 82, 83, 105, 116, 117, 128, 200, 243,
Odiham, Hampshire 69
Oeppen, J.E. 6, 43, 44, 54, 57, 69, 71, 253
O'Grada, C. 258
Oldstone, M. B. A. 141
Omran, A. R. 120
Open University 75, 113
Osmani, S.R. 210
Ottery St. Mary, Devon 49
Oxfordshire 31, 97, 99, 101, 109, 179-181, 184, 187
Oxley, D. 192, 233

Past and Present 140, 229, 246, 258
Penfold, E.W.D. 116, 243
Penrith, Cumberland 179
Pepys, E. 168
Pepys, S. 147, 157-168, 170, 171, 224
Pertenhall, Bedfordshire 202
Peru 260
Picard, L 154, 164
Pitkanen, K.J. 178
Place, F. 142, 173
Platter, T. 150
Poddington, Bedfordshire 74, 95, 96, 99, 109, 112, 134, 202
Poole H.E. 151, 152, 161, 165
Population and Development Review 125, 253, 258
Population Studies 3, 44, 45, 60, 77, 89, 90, 98, 115, 121, 135, 142, 174, 178, 180, 198, 238, 255
Porter, R. 142, 169, 171, 207, 208
Porter, S. 120
Pottman Family 36
Potton 202
Pozzi, L. 89, 98
Preston, S.H. v, 255, 258
Pugh, B. 195
Ranis, G. 234, 235
Rashad, H.R. 197
Ravallion, M. 255, 256, 266
Rayleigh, Essex 180
Razzell, P.E. 4, 5, 8, 10, 25, 32, 38, 46, 59, 63, 65, 66, 68, 75, 76, 78-81, 85, 87, 90, 97, 98, 105, 110, 113, 116, 117, 120-122, 129, 140, 142, 143, 148, 150, 161, 169, 176-178, 181-183, 185, 191-194, 203, 205, 233, 236, 246, 251, 264
Record, R.G. 90
Reddaway, T.F. 158
Reid, A. 89, 148, 199
Renhold, Bedfordshire 202
Ricardo, D. 235
Rickman, J. 126
Riley, J.C. 120, 223, 258, 259
Riseley, Bedfordshire 140, 141, 179
Rochester, Kent 62, 63, 105, 237
Rodmell, Sussex 37
Rowlandson, T. xv, 215, 224
Rowntree, S. 210, 215, 216, 218, 219
Royal Society 143, 176
Ruggles, S. 44, 48, 59-62, 79, 127
Rutland 101
Rutten, W. 191

Rwanda 261
Saah, A.J. 141
Saffron Walden, Essex 30
Sandy, Bedfordshire 25, 27
Saudi Arabia 260-263
Schofield, J. 157
Schofield, R.S. 3-6, 19, 32, 33, 43-47, 86, 96, 101, 126, 139, 140, 143, 197, 205, 253, 258
Schurer, K. 14, 20, 90, 101, 199, 204
Scotland 101, 118, 178, 179, 183, 184, 187, 188
Scott, S. 177, 178
Senegal 261
Shaw, C. 233, 234
Shaw, L.M. 116
Shaw, M. 197, 273
Shefford, Bedfordshire 202
Shelton, Bedfordshire 202
Shepshed, Leicestershire 15, 69
Shillington, Bedfordshire 25-27
Shlomowitz, R 121, 142, 173
Short, T. 208
Shropshire 3, 101, 179
Sierra Leone 261
Simon, J. 125, 229, 230, 253
Sinclair, J. 212
Skipton-in-Craven, Yorkshire 179, 181
Skold, P. 178, 181, 191
Smiles, S. 218
Smith, A. xviii, 89, 125, 253, 267
Smith, J.R. 182, 183, 188, 193
Smith, V. 174
Snell, K.D.M. 245
Social History of Medicine 43, 89, 121, 142, 173, 191, 197, 205, 273
Society of Genealogists' Library v, 7, 11, 13, 30, 75, 80, 84, 95, 100, 101, 105, 107, 109, 111, 112, 129, 132, 138, 140, 178, 183, 189, 190
Somerset 101
Souden, D. 128
Southampton, Hampshire 10, 180, 181
Southill, Bedfordshire 34, 52, 69, 202
Spence, C. v, 76, 80, 89, 98, 105, 110, 197, 203, 253
Sri Lanka 258
St. Aphage, Canterbury 75, 76
St. Cuthbert, Bedford 202
St. James, Norwich 75, 76
St. Peter, Ipswich 75, 76

Stationers' Company 83, 84
Steel, D.J. 4, 62
Stevenson, T.H.C. 113, 114, 203
Stevington, Bedfordshire 34
Stone, L. 238, 246
Stotfold, Bedfordshire 202
Stow, J. 158, 166, 169
Stow Maries, Essex 95, 99
Streatley, Bedfordshire 202
Suffolk 30, 31, 64, 101, 114, 180
Surrey 97, 101, 177, 179
Sussex 8, 37, 83, 101, 116, 117, 127, 200, 216, 243, 244
Sutton Courtenay, Berkshire 180
Svedberg, P. 256, 267
Sweden 177, 181, 183, 184
Swindon, Wiltshire 10, 20, 22, 23, 105
Szreter, S. 89, 199
Tanner, J.M. 211
Tate, W.E. 36
Tenterden, Kent 179-181, 183
Terling, Essex 52, 69, 71
Thanet, Kent 180
Thaxted, Essex 30
Thorton Lansdale, Yorkshire 178, 179
Thurley, S. 149, 155, 156
Tilbrook, Bedfordshire 202
Tingrith, Bedfordshire 202
Toddington, Bedfordshire 25, 26, 27, 202
Togo 261
Truro, Cornwall 94-98, 102, 103, 109-112, 120, 179, 180
Tryon, T. 205, 206, 213, 224
Tunstall, Kent 36
Turner Family 8, 9
Turner, M. 84
Turner, T. 8
Turvey, Bedfordshire 34, 202
United Arab Emirates 260
Van Der Woude, A.M. 144
Vann, R.T. 81, 93, 94, 108, 140, 141
Venezuela 260
Voth, H.J. 191, 192, 233
Wadd, W. 212
Wadsworth, F.A. 82, 128
Wainwright, R. 205, 233
Waldron, Sussex 37
Wanborough, Wiltshire 10
Wang, J. 255

Ward, J.E. 178, 189,
Warwick, Warwickshire 114, 115
Waterford, Ireland 94, 108, 170
Webb, C. 100, 129
Weir, A. 91, 147, 149-151, 154
Weinreb, B. 134
Wembworthy, Devon 129, 130
Westmoreland 101
Weston Colville, Cambridgeshire 95, 99, 105, 109, 112
Wetherby, Yorkshire 129, 130
Wexford, Ireland 94, 108
White, G. 142
Whitchurch, Oxfordshire 31
Whitehaven, Cumberland 178, 179, 186, 189, 190
Whittington, Shropshire 179
Wilkinson, R.G. 119, 197, 204, 226, 273
Williams, N. 77, 89, 150
Williamson, J.G. 234
Willis, A.J. 131
Wilson, A. 155
Wiltshire 10, 20, 64, 101, 105, 179
Woburn, Bedfordshire 25-27, 34, 35, 202
Woburn Sands, Bedfordshire 34
Wolsey, Cardinal 151
Wood, A. 161
Woodchurch, Kent 95, 99, 105, 109, 112
Woodford, Kent 105
Woodforde, Rev. J. 209, 224
Woods, R. 89, 102, 119, 200, 203
Worcestershire 99, 101, 109
Wortley Montagu, Lady M. 175
Wrestlingworth, Bedfordshire 202
Wrigley, E.A. 3-6, 17, 19, 32, 33, 43-48, 50-58, 60, 61, 64, 67-69, 71, 77, 78, 85, 86, 96, 126, 139, 140, 143, 253
York 139, 210, 218
Yorkshire 64, 84, 101, 105, 109, 130, 178, 179, 190, 243
Zambia 261
Zinsser, H. 140
Zola, J. 254

Subject Index

adult mortality	44, 48, 49, 59, 77-79, 81-83, 85-87, 100, 101, 106, 107, 115, 117-120, 126, 131, 136, 137, 141, 193, 194, 197, 198, 200, 201, 203-205, 220, 221, 224, 226, 255, 271-273
adults	xviii, 16, 19, 20, 29, 31, 33, 38, 39, 44, 48, 49, 59, 76-87, 97, 99, 100, 101, 106, 107, 110, 115, 117-120, 126, 131, 135-137, 139-141, 177-184, 187, 188, 193, 194, 197-205, 210, 211, 220, 221, 224, 226, 254, 255, 262, 271-273
age structure of population	47, 59, 118
agricultural improvement	143
agricultural labourers	114, 115, 212, 244
alcohol	94, 102, 213-226, 274
apprenticeship premiums	100, 106, 107
apprenticeship register, national	100, 101, 106, 107
archbishops	237, 238
aristocracy	77, 78, 87, 90, 117, 118, 120, 122, 132, 147, 173-176, 198, 199, 209, 210, 225, 236, 237, 239, 250, 274
army officers	236-240, 246, 250
artisans	29, 63, 79, 103, 105, 112, 116, 117, 127, 128, 200, 238, 246
bachelors	20, 131
back projection	43, 45
bakers	221
baptism	4-11, 14-16, 18, 19, 33, 37-39, 45-49, 55, 59, 67-69, 71-78, 95, 96, 109-112, 132-134, 138, 155, 201
baptism rate	47
baths	149, 150, 162, 175
beer	150, 166, 214-216, 246
beggars	150, 154
bills of mortality, London	15, 16, 83, 110, 140
bills of mortality, Northampton	110
birth intervals	54, 55
birth-baptism intervals	4, 33, 49, 67-69, 71
bishops	237, 238
bleeding as medical treatment	148, 164
breast feeding	54, 55, 121, 142, 156, 175
burial rate	46, 47
capitalism	231, 234, 249, 250, 251, 265, 267, 274
carpenters	114

censuses 4-6, 10, 11, 16, 19, 22, 23, 39, 44-46, 51, 55, 57, 61, 65, 67, 68, 73, 87, 96, 105, 113, 129, 184, 201-204, 226, 244
cesspits 157, 171
chamber pots 157, 161
child mortality 9, 14, 16, 18, 19, 25, 48, 53, 67, 69-72, 74-76, 86-89, 92-105, 107, 109-113, 115, 120, 122, 126, 132-135, 137, 138-143, 147, 168, 169, 174, 193-195, 254-257, 259, 262-265, 271-273
childbirth 164, 224, 225
children 7-21, 23, 48, 54-56, 59, 67-69, 71, 73, 74, 76-78, 90-92, 95, 97-99, 103-105, 109-113, 121, 132-135, 138, 141, 142, 147, 148, 155, 156, 167, 172, 173, 176-184, 186-189, 192-195, 214, 233, 248, 258, 262
church court witnesses 129, 131
cinchona bark 148
civil registration 51-53, 68, 90, 91, 94, 115, 192, 198, 201, 204
cleanliness 121, 141, 142, 148, 149, 151, 152, 159, 160, 162, 163, 169, 171-175, 241
clergymen 4, 14, 22, 24, 36-38, 67, 132, 206, 237, 239
clerks 4, 22, 36, 37, 114, 115, 221
clothes 141, 142, 165, 173, 212
colostrum 148, 156
conduits 149
Congregationalists 34, 35
consumption patterns 218-220, 226, 246, 250, 251, 267
contamination of food and drink 166, 167
cotton clothing 141-143, 173, 175
dampness in houses 160, 171
developing countries 142, 249, 254-256, 265, 267, 268, 274,
diarrhoea 142, 168
diet 205, 207--210, 212-214
digitalis 148
dirt 151, 162, 166, 174
disease environment 89, 90, 92, 93, 97, 98, 100, 105, 107, 115, 118-120, 122, 142, 144, 149, 168, 199, 223, 273, 274
disease virulence 139, 140, 144, 168, 188, 191, 192, 194, 205, 273, 274
dogs 150
drainage 121, 143, 157, 158, 170, 171, 175, 178
dysentry 167
earth floors 121, 122, 141, 150, 161, 162, 175
economic development 125, 140, 143, 144, 194, 229, 230, 235, 236, 247, 250, 253-255, 258, 262, 264-267, 272, 274
education 241, 246, 255, 256, 258, 259
elite families 102-104, 111, 131-133, 135, 139, 141, 148, 202-204, 240, 245
elite occupations 102, 111, 132, 134, 201, 237-239, 246
Eltham ordinances 151, 152

employment 238, 240, 245, 248, 263, 268
enclosure of land 240, 250, 251
endemic infection 97, 100, 120, 177, 178, 180, 181, 183, 184, 187, 188
enumeration listings 10-14, 16, 19-23, 47, 56, 63, 65, 103, 129-131, 201
epidemics 97, 140, 177, 181, 183-185, 189
epidemiological transition 120
epidemiology xviii, 97, 120, 184, 197, 272, 273
excrement 153, 157, 160, 161, 166, 170
exogenous role of demographic factors xvii, xviii, 126, 194, 230, 231, 250-255, 264, 265, 267, 272-274
expectation of life 77-79, 81, 82, 84, 85, 90, 117-119, 175, 197, 198, 203, 221-223, 247, 255, 259-263, 265
farmers 29, 59, 63, 79, 105, 112, 114, 116, 117, 127, 128, 200, 212-214, 221-224, 238, 239, 241
fecundity 54, 191
fertility 19, 43, 44, 46-48, 52, 57, 58, 65, 67, 87, 126, 131, 144, 148, 188, 191, 231, 240, 242, 244, 253, 265-272, 274
fever 140, 141, 167, 168
fishermen 63, 79, 116
fleas 157, 163, 164
food 90, 102, 151, 166, 167, 174, 175, 204, 207-210, 212, 213, 219, 224-226, 229, 235, 274
friendly societies 220, 221, 222
gastro-enteritis 167, 168
gentlemen 29, 105, 111, 116, 117, 127-129, 132, 200, 202, 206, 207, 213-215, 219, 242-244
gentry 24, 63, 79, 106, 120, 173, 176, 207, 209, 214, 234, 236, 237, 239, 250, 251, 274
gin 214
gout 148, 209, 225
healing 154, 155
hearth tax 11, 101
height xviii, 156, 191, 192, 211, 231-233, 273
housing, timber-framed 157
husbandmen 24, 29, 63, 79, 106, 116, 117, 127, 128, 200, 206, 242, 246
husbands 20-23, 66, 202,-204, 232
hygiene, domestic 141, 157, 164, 172, 173, 175
hygiene, personal 93, 121, 142, 143, 161, 162, 164, 165, 170, 174, 175
illegitimacy 71, 77, 95, 147
improvement acts 121, 142, 171, 175
income 44, 140, 215, 218-220, 229-231, 245, 248, 255-259, 261-264
income distribution 119, 231, 234, 235, 238, 256, 261, 263, 267, 274
Independents 34, 35
industrial revolution 87, 125, 229, 231, 233, 234, 247, 251, 265, 273
inequality 197, 205, 226, 231, 233-236, 254, 265, 267, 268, 273, 274
infant feeding 156

infant mortality 3, 14, 15, 25, 49, 51-53, 55, 67-77, 90, 92, 94, 96, 103-105, 107-115, 119, 136, 137, 139, 148
infection 90, 93, 98-101, 140, 141, 148, 150-153, 155, 156, 164, 181, 183, 191, 197, 205, 258, 262
inflation ratios 4, 16, 19, 46, 70, 73, 98, 105, 108, 133, 134, 138
influenza 151
inoculation against smallpox 93, 97, 121, 122, 142, 143, 148, 155, 175-177, 180-182, 184, 187-189, 192-195
insurance companies 220, 222
kidney stone 167
kitchens 141, 149, 151-153, 156, 157, 159, 162, 163, 170
labourers 29, 59, 79, 93, 105, 106, 112, 114, 117, 119, 127-129, 132, 200, 202, 203, 205, 212, 213, 215, 219, 243-246, 248, 264
lancets 164,
land drainage 121, 143, 175
land ownership 128, 235, 240, 247, 251, 264
latrines 157, 159
lice 140-142, 157, 163
life tables 44, 86
linen clothing 141, 142, 165, 172
literacy 246, 251
lithotomy 148
malaria 100, 120, 140, 143, 148, 167, 175, 258
malnutrition 54, 210, 258
manure 157, 158, 165, 170
market towns 121, 122, 182
mariners 21, 116
marital status 20, 65, 129
marriage 4, 8, 10, 11-14, 20, 22, 33, 37-39, 44, 48, 49, 56-67, 77-85, 87, 103, 115-118, 125, 127, 128, 129, 131, 132, 135, 173, 184, 191, 199-201, 239-247, 251, 271, 272
marriage age 48, 60, 61-64, 129, 131, 191, 242, 243,
Marriage Duty Act 10-12, 14, 20, 22, 33, 132
marriage licences 61-63, 66, 67, 77, 79-85, 87, 115-118, 127, 128, 130, 131, 199-201, 242, 243
marshes 7, 96, 100, 120, 150
maternal mortality 148, 225
measles 167, 183, 260-262
medieval society 121, 229-231, 263, 264
Members of Parliament 79, 87, 117, 118
merchants 79, 84, 85, 87, 93, 96, 102, 105, 106, 111-113, 116, 120, 134, 137, 138, 200-202, 210, 234, 235, 237-239
Methodism 34, 35
methodology xvii, 39, 44, 48, 53, 60, 65, 87, 103, 113, 118, 191, 197, 201
middle class 93, 115, 119, 122, 170, 225, 236, 241, 246, 250, 251
midwifery 164
migration 4, 44, 48, 49, 59-62, 69, 79, 103, 127, 128, 202, 230,

248, 268
militia 178, 232
milk 166, 206, 215
miners 115, 221
moats 149, 152
Mormons 39
mosquitoes 152
name variants 25, 56,
negligence, registration of vital events 4, 35, 36, 38, 39
neo-natal mortality 69
night-soil men 157
nominal record linkage 4, 19, 39, 48, 75, 86, 87
nuptiality 43, 57, 65, 67, 87, 125-127, 129-131, 273
nutrition 54, 89, 90, 121, 122, 140, 142, 173, 192, 197, 204, 205, 209-211, 214, 233, 258, 271
obesity 206-208, 210
occupation 24, 29, 87, 93, 100, 101, 105, 106, 112-119, 127-129, 132, 137, 199, 200, 203, 221, 222, 237-239, 242, 243
painters 221
pauper burials 31, 32
paupers 31, 32, 93, 101, 105, 112, 246
parish clerks 4, 36, 37
paving of streets 169, 175
physical inactivity 102, 204, 206, 212, 219-222, 224, 226, 274
physicians 148, 154, 163, 164, 172, 209
pickpockets 150
pigs 151, 165, 212
plague 119, 120, 135, 141, 153, 155, 161, 167, 229, 231, 263, 264
plumbers 221
plumbing 157
poll tax 12, 20
poor law records 31, 32, 55, 87
population change xviii, 19, 44, 45, 47, 58, 86, 87, 89, 125, 126, 139, 140, 143, 144, 177, 187, 229-231, 234-236, 238, 240, 245-247, 250, 251, 253-256, 263-268, 274-274
population density 71, 92-94, 96, 229
population size 27, 28, 30, 31, 38, 47, 71-73, 93, 95, 96, 132, 136
poverty xviii, 89, 92, 102, 107, 119, 120, 122, 125, 137, 197, 198, 205, 210, 213, 215, 216, 218-221, 234, 240, 241, 246, 248, 251, 253-259, 262-267, 273, 274
prices 62, 210, 229, 230, 235, 249, 250
Primitive Episcopalians 35
probate records 19, 23-31, 55, 57, 296
professionals 29, 43, 63, 79, 93, 102, 105, 106, 111-117, 120, 122, 127-129, 137, 138, 200-202, 211, 235, 237, 239, 243, 244
prostitutes 150
Protestant Dissenters 34, 35

public health 121, 126, 142, 148, 150, 168, 169, 172, 173, 175, 197, 205, 255, 258, 259, 262-264, 271, 273
purging as medical treatment 148
Quakers 34, 35, 81, 82, 93, 94, 96, 107, 108, 135, 137
rateable value 136, 137, 201
rats 140, 157
reconstitution research 9, 11, 14-18, 30, 43, 44, 48-55, 57-61, 63-65, 67-73, 75, 77-79, 86, 87, 92, 94, 95, 97, 102, 105, 108-113, 129, 181
Registrar-General's Reports 35, 45, 53, 64, 68, 75, 83, 118, 136, 192, 202, 203
registration fees 4, 31, 35, 36
registration reliability, Anglican 3, 4, 6, 7, 9, 12-17, 19-25, 29, 31-33, 35-39, 45-47, 49, 51, 52, 54-56
registration reliability, non-conformist 3, 24, 25, 33-35
residual non-registration 4, 33, 35
rickettsia prowazekii 141
rough note books 4
royal family 91, 92, 120, 147, 149, 153, 155, 156, 164, 175, 176, 195, 219
royal residences 120, 147, 149-156
rural districts 72, 73, 75, 77, 81, 92-99, 108, 109, 110, 122, 134, 139, 147, 171, 175, 182-184, 187, 193, 199, 201, 202, 205, 206, 214, 216
rushes 150, 151
saltpetre 161, 162
same-name technique 6, 7, 9, 13, 14, 16, 56, 108
sample size 28, 31, 85, 131, 203, 211
sanitary conditions 118, 121, 122, 147, 149-151, 153, 155, 157, 158, 160, 162, 165, 168, 170, 171, 174, 197
scarlet fever 167
Scottish advocates 77, 79, 117, 118
scrofula, touching for the King's Evil 154, 155
scurvy 167, 172
servants 120, 122, 127, 131, 152, 159, 173, 201, 232, 238, 245
sewerage 149, 152, 158, 171, 172, 175
sexuality 165, 268
siblings 6, 7, 10, 11, 14-16, 56
smallpox 97, 98, 120-122, 125, 140-143, 148, 155, 167, 168, 175-195, 205, 233, 262
smallpox, age incidence 98, 177, 178, 182, 185, 187, 188, 193, 194
smallpox, case-fatality 177, 178, 185-186, 189, 191-193, 205
smells 150, 165, 212, 219
soap 142, 174
social change 125, 229, 267
social class 89, 90, 113, 114, 119, 120, 122, 138, 142, 143, 170, 172, 173, 183, 192, 195, 197, 199, 200, 203-205, 210-212,

215, 216, 218-221, 225, 226, 233-236, 238, 240-242, 244-246, 250, 251, 264, 271, 272
socio-economic status 29, 38, 39, 59, 63, 79, 87, 93, 102-106, 111, 112, 115, 118, 119, 122, 128, 129, 132, 134, 135, 138, 139, 141, 142, 198, 200, 201, 205, 206, 220, 223, 236, 242-245, 247, 268-273
sociological variables xviii, 59, 79, 113, 127, 203, 238, 240, 254
spinsters 29, 58, 61, 64, 66, 79, 82-84, 116, 128, 131, 243, 244
spitting 150, 165
standard of living 89, 125, 140, 191, 231, 233, 240, 245, 247, 250, 263, 264, 273, 274
statistical methodology 3, 6, 55, 78, 143, 211, 221, 255
surplus labour 231, 235, 247, 250, 253, 265, 267, 268, 274
sweating sickness 149, 151
taxation 12, 15, 20, 62, 100, 103, 250
teachers 115
textile workers 115
tobacco 102, 154, 213, 215, 218, 219, 223, 226, 274
tontines 77, 79, 87, 117, 118
towns, small 31, 96, 206
tradesmen 24, 29, 103, 105, 112, 117, 127, 128, 200, 237-239, 241, 246
traffic in corpses 21, 24
triangulation xvii, 16, 91, 201
tuberculosis 165, 167, 188
typhoid fever 167
typhus 140-142, 167, 168
under-enumeration 12
urban districts 77, 79-82, 92, 94, 108, 122, 139, 142, 144, 175, 189, 192, 201, 233
urination 150, 152, 157, 158, 160, 161, 170
vaccination 75, 91, 93, 114, 121, 125, 142, 175, 177, 187, 188-190, 192-195, 258, 262
venereal disease 147, 167
vomit 150, 166
wages 140, 212, 230, 231, 238, 245, 249, 267
washing 141, 162, 165, 166
water 141, 142, 149, 152-155, 157, 159, 160, 162, 163, 165, 166, 169-171, 174, 175, 212, 215, 258
water closets 157, 175
wealth 12, 13, 15, 24, 32, 89, 90, 92, 93, 96, 101-107, 111, 112, 117-120, 125, 129, 131, 132, 134-138, 143, 147, 148, 171, 173, 174, 183, 195, 198, 200, 201, 204, 206, 208-214, 219, 221, 224, 226, 229, 231, 234, 235, 238-240, 242, 245-248, 250, 251, 253-265, 267, 271, 273, 274
weight 208, 210, 211, 224
wells 157, 158, 166, 169, 171
widowers 20, 21, 23, 56, 131, 201, 202
widows 20-25, 29, 56, 65, 66, 131, 201, 202
wigs 163, 184

wills 10, 11, 23, 24, 31, 56, 85, 87, 102, 103
wine 166, 205, 206, 210, 214, 224, 225
wives 8, 20-23, 49, 129, 147, 159, 160-165, 168, 182, 201-204, 213, 215, 243
woollen clothing 141, 142, 173
working class 115, 142, 143, 173, 205, 211, 215-220, 225, 233
world trade 141, 240, 250
yeomen 24, 29, 116, 117, 127, 128, 152, 156, 200, 234, 235, 242-244, 246

The London Journal, Vol. 32, No. 3, November 2007, 271–292

The History of Infant, Child and Adult Mortality in London, 1550–1850

PETER RAZZELL AND CHRISTINE SPENCE

University of Essex, UK

The paper uses a range of sources — parish registers, family histories, bills of mortality, local censuses, marriage licences, apprenticeship indentures, and wills — to document the history of mortality of London in the period 1538–1850. The main conclusions of the research are as follows:

1. *Infant and child mortality more than doubled between the sixteenth and the middle of the eighteenth century in both wealthy and non-wealthy families.*
2. *Mortality peaked in the middle of the eighteenth century at a very high level, with nearly two-thirds of all children — rich and poor — dying by their fifth birthday.*
3. *Mortality under the age of two fell sharply after the middle of the eighteenth century, and older child mortality decreased mainly during the late eighteenth and early nineteenth century. By the second quarter of the nineteenth century about 30 per cent of all children had died within the first five years. This latter fall in mortality appears to have occurred equally amongst both the wealthy and the non-wealthy population.*
4. *There was little or no change in paternal mortality from 1600 to 1750, after which date there was a steady reduction until the middle of the nineteenth century. The scale of the fall in adult mortality was probably less than the reduction in infant and child mortality. The latter more than halved between the middle of the eighteenth and nineteenth centuries, whereas paternal mortality fell by about a third in the same period.*
5. *There appears to have been a minimal social class gradient in infant, child and adult mortality in London during the period 1550–1850. This is an unexpected finding, raising fundamental questions about the role of poverty and social class in shaping mortality in this period.*
6. *Although migration played a leading role in fostering the population increase in London in the sixteenth and early seventeenth centuries, relatively low infant and child mortality made a major contribution to population growth during this period.*

Introduction

It is widely accepted that London's population growth since the sixteenth century has had a significant impact on its economic and social development, influencing not only the supply of labour but also the demand for a range of goods and services, including housing and the urban infrastructure.[1] It has also been generally assumed that because of its high level of mortality before the nineteenth century, most of London's growth was brought about by migration rather than endogenous population increase.[2]

© The London Journal Trust, 2007 DOI 10.1179/174963207X227578

Furthermore, it has been widely believed that there was a close association between poverty and all forms of mortality from at least the sixteenth century onwards.[3] However, many of these assumptions remain untested due to the lack of reliable evidence as a result of inadequate source material.

Most previous research on London's demographic history has been based on the Bills of Mortality,[4] although the reliability of this source has been subject to much criticism.[5] There is also the problem that the Bills only allow an aggregative study of London's population history, whereas much modern demographic research focuses on individual families enabling a more detailed study of a range of variables.[6] We have attempted to address these issues by creating family-level data, and assessing the quality of these data through detailed methodological analysis.

The present paper concentrates on the history of mortality, seeking to establish changing levels of mortality in the period between the middle of the sixteenth and nineteenth centuries. Parish registers, guild records, wills, census listings and the Bills of Mortality have been used as a basis for creating family reconstitution and other data. The focus in this paper has been on samples of individual families from a variety of different parishes and districts in London. Given the nature of the data, the conclusions reached are necessarily provisional. However, we have attempted to construct a picture of mortality change over this long period, in the belief that this creates fruitful hypotheses about long-term patterns of mortality. Only minimal interpretation of suggested trends has been carried out, mainly because of the absence of studies of disease patterns during the period covered.

An analysis of the relationship between wealth/poverty and mortality has been included. Virtually all writers on the subject — including Chadwick, Marx, Engels and Mayhew[7] — have assumed that poverty was strongly associated with ill-health and high mortality, and yet we have found in our research that this was not the case in London before the mid-nineteenth century. For example, as we will see later, the healthiest areas with the lowest mortality in 1838–44 were not the wealthy districts of the West End, but the poor areas of the East End of London. We will argue in this paper that mortality was not primarily shaped by wealth and poverty, but mainly by exogenous disease patterns largely independent of economic factors.[8]

Likewise it has been widely assumed that London until the nineteenth century was a 'mortality sink', sucking in England's surplus population because of its inordinately high mortality.[9] One of the main findings of the paper is that in the period between 1550 and 1650, London's infant and child mortality was relatively low, and that this helped generate the rapid population growth of the city during this period.

Additional work will be required to evaluate these radical conclusions, but we hope the paper will stimulate further research on London's population history in the belief that this will significantly illuminate the history of the city over a three hundred year period.

Infant and child mortality

Evidence on infant and child mortality is available in the London Bills of Mortality for the period from 1728 onwards, and is summarised as follows:

TABLE 1

Infant and child mortality from the London Bills of Mortality, 1728–1829

Period	Number of baptisms	Number of burials under two years	Burials under two as a proportion of the number of baptisms	Number of burials aged two to five years	Burials aged two to five as a proportion of the number of baptisms	Number of burials aged under five	Burials under five as a proportion of the number of baptisms
1728–29	33,712	20,586	61.1%	4923	14.6%	25,509	75.7%
1730–39	170,196	101,860	59.8%	23,250	13.7%	125,110	73.5%
1740–49	145,260	88,320	60.8%	21,637	14.9%	109,957	75.7%
1750–59	147,792	75,083	50.8%	18,793	12.7%	93,876	63.5%
1760–69	159,603	78,803	49.4%	21,015	13.2%	99,818	62.5%
1770–79	173,178	77,173	44.6%	21,019	12.1%	98,192	56.7%
1780–89	176,299	63,637	36.1%	18,229	10.3%	81,866	46.4%
1790–99	187,345	61,793	33.0%	20,885	11.1%	82,678	44.1%
1800–09	199,043	55,277	27.8%	21,607	10.9%	76,884	38.6%
1810–19	221,334	54,065	24.4%	19,227	8.7%	73,292	33.1%
1820–29	256,576	58,070	22.6%	20,432	8.0%	78,502	30.6%

Source: J. Marshall, The Mortality of the Metropolis (1832).

Table 1 indicates that infant and child mortality was more or less constant between 1728 and 1749, but fell steadily and progressively from 1750 to 1829. There has, however, been controversy about the reliability of the Bills of Mortality and there is no consensus about the quality of either birth or death registration.[10]

Attempts have been made to address this problem by applying family reconstitution techniques to parish register and other data. Finlay has analysed a number of London parish registers for the period 1580–1650,[11] and Landers and Vann & Eversley have used London Quaker records for reconstitution research.[12] None of these studies has been able to completely resolve the problem of burial register reliability. Finlay found very low rates of infant mortality for most of the parishes studied — in one case as low as 55 per 1,000[13] — and assumed that much of this was due to burial under-registration. The findings of the separate studies carried out by Landers and Vann & Eversley on Quaker infant mortality were contradictory,[14] and this may have been because of the different nature of the samples involving variations in data quality.

We have conducted reconstitution research on a number of parishes in the City of London, linked to the published and indexed London 1695 Marriage Duty Act Listing, which provides not only details of living family members, but also levels of taxable wealth.[15] The creation of reconstitution data was facilitated by the genealogical work of Percival Boyd, who in the late 1930s and 1940s compiled 238 volumes of family histories for London inhabitants, covering a total of 59,389 family groups.[16] Boyd used parish registers, guild records, marriage licences, wills and a whole miscellany of sources, to create individual family histories mainly for the sixteenth, seventeenth and eighteenth

centuries, enabling the tracking of children from baptism through to the date of last independent observation of the family.

The individual family sheets are not in standard format but usually include information on names of parents and children, as well as date of baptism and burial of children. Boyd sometimes estimated the year of birth of a child from wills and other documentary sources, and the lack of standardisation means that his family histories have to be treated with some care. However, as we are concerned here with mortality and not fertility, it is the quality of burial registration which is most important. Given the uncertain quality of burial register data, it is important to evaluate its reliability before embarking on detailed research on mortality.

There was a custom in England of giving the name of a dead child to a subsequent child of the same sex. Evidence from local censuses and other listings suggests that there were no living children with the same name in individual families in the period covered by this paper.[17] Where two children of the same family were baptised with an identical name, it is therefore possible to measure the completeness of burial registration by searching for the first same-name child in the burial register. (It is the first of a pair of children with identical names that is designated as a same-name child.) The technique can only be applied to families with at least two recorded baptisms of children of the same sex, but it is a valuable method of assessing the quality of burial registration.

This can be illustrated by the example of one family listed by Boyd and traced in the 1695 Marriage Duty Listing (see Table 2).

Of the three same-name cases, highlighted in bold, two of them were traced in the burial register. The second same-name case — John baptised on the 7th August 1687 — was found neither in the burial register nor in the 1695 Marriage Duty Listing, indicating that he probably died without being registered. (The last John was baptised in late 1695 and therefore did not appear in the Marriage Duty Listing made before that date.)

The same-name method allows for the correction of burial under-registration by multiplying the number of recorded burials by the total number of same-name cases

TABLE 2.

The family of Samuel and Sarah Fowler, tyler and bricklayer, of St. Antholin's, London

Name of child	Date of baptism (day/month/year)	Date of burial (day/month/year)
Thomas	05/07/1677	04/01/1721
Samuel	**04/05/1679**	**29/04/1681**
William	08/01/1683	03/06/1708
Samuel	10/05/1685	15/02/1688
John	**07/08/1687**	–
John	**12/05/1689**	**09/10/1692**
Sarah	22/04/1691	06/02/1748
Mary	18/07/1693	12/11/1694
John	21/11/1695	–

Source: 1695 Marriage Duty Listing: Samuel Fowler, wife Sarah, son James, son Thomas, son William, daughter Sarah. Of St. Antholin's Parish.
Source of main text of table: Boyd's London Inhabitants.

and dividing by the number of same-name cases found in the burial register. In the case of the Fowler family, the correction ratio is 3/2. This inflation ratio corrects both for non-registration due to omission from the burial register, as well as burial in neighbouring parishes and elsewhere, accounting for all forms of under-registration.

A sample was constructed from the Boyd volumes by selecting, in sequence, families from the first eight parishes in volumes 1–28, and this sample has been used in all tables analysing Boyd family listings. The eight parishes included in the sample were: St. Christopher le Stocks, St. Edmund Lombard Street, St. Martin Outwich, St. Antholin, St. John Baptist, All Hallows Bread Street, St. John Evangelist, and St. Mary Woolnoth. These eight parishes are not necessarily representative of over 100 parishes that existed in the City of London, although independent evidence to be considered later suggests that mortality levels in the eight parishes were probably fairly typical of London as a whole.

We can compare the burial registration experiences of wealth holders with those not owning the form of wealth eligible for extra taxation indicated in the 1695 Marriage Duty Act returns.[18] Of 64 same-name children from wealth-holding families included in Boyd's sample and traced in the Marriage Duty Listings, 18 (28 per cent) could not be found in the burial register, compared to 30 of 81 (37 per cent) from non-wealth holding families.

Of 37 eligible same-name children[19] not found in the burial register, none could be found in the Marriage Duty Listing, providing some support for the assumption that a missing same-name case is equivalent to an unregistered burial. Overall, 33 per cent of same-name cases could not be traced in the burial register, suggesting that about a third of all infant and child deaths were not registered. Applying the overall same-name correction ratio to all baptisms and infant burials in the sample generates a corrected infant mortality rate of 334 per 1,000 for the period 1681–1709. John Landers has independently estimated that infant mortality in London at the end of the seventeenth century was at least 360 per 1,000.[20] Given that mortality before baptism is excluded from the figure of 334 per 1,000, it is very similar to that estimated by Landers.

Child mortality can be calculated by establishing the children at risk — children surviving the first year and remaining in independent observation (through a recorded event of another family member in the Boyd and marriage duty records) until their fifth year — and dividing the number of corrected child burials (burials multiplied by the same-name ratio) by the number of children at risk. We can estimate infant and child mortality rates amongst those listed as owning and not owning taxable wealth in the Marriage Duty Act listing as summarised in Tables 3 and 4.[21] Both infant and child mortality were highest among non-wealth holders, although these forms of mortality were still high amongst wealthy families, with nearly half of their children dying under the age of five.

It is possible to extend research on the Boyd data both backward and forward in time. Tables 5 and 6 contrast data for the total sample with that for members of the 12 great livery companies, designated as elite families.[22] After 1750 there is insufficient information on elite families for a breakdown of these data.

The proportion of same-name cases untraced in the burial register for the whole period 1539–1849 is identical in both the total and elite samples — 112/320 and 51/146

TABLE 3

Corrected infant mortality rates (per 1,000) amongst London wealth and non-wealth holders, 1681–1709

Wealth holders				Non-wealth holders			
Number of baptisms	Number of infant burials	Same-name ratio	Infant mortality rate per 1,000	Number of baptisms	Number of infant burials	Same-name ratio	Infant mortality rate per 1,000
611	131	61/46	284	642	155	81/51	383

Source: Boyd's London Inhabitants; Glass, *London Inhabitants.*

TABLE 4

Corrected child mortality (1–4) rates (per 1,000) amongst London wealth and non-wealth holders, 1681–1709

Wealth holders				Non-wealth holders			
Number of children (1–4) at risk	Number of child (1–4) burials	Same-name ratio	Child (1–4) mortality rate per 1,000	Number of children (1–4) at risk	Number of child (1–4) burials	Same-name ratio	Child (1–4) mortality rate per 1,000
448	62	61/46	184	424	62	81/51	232

Source: Boyd's London Inhabitants; Glass, *London Inhabitants.*

— 35 per cent. The proportion of untraced cases for the complete sample over time was as follows: 1539–1599: 17/48 (35 per cent); 1600–1649: 31/83 (37 per cent); 1650–1699: 32/99 (32 per cent); 1700–1749: 29/68 (43 per cent); 1750–1849: 6/22 (27 per cent). The numbers are too small to analyse differences between elite families and the total sample, or variations over time in the period 1750–1849.

Mortality was lower amongst the elite group than in the total sample population during the period 1539–1649, but this differential was reversed in the period 1650–1749 when mortality was higher amongst wealthier families. However, the most striking feature of Tables 5 and 6 is the very significant increase in infant and child mortality between the periods 1539–1599 and 1700–1749 in both groups. Infant mortality increased by about two-and-a-half times in the total sample, and more than tripled among elite families during this period. Child mortality approximately doubled in both groups between the sixteenth and the middle of the eighteenth century. There was also a marked drop in infant mortality among the total sample after the middle of the eighteenth century, similar to that depicted in the Bills of Mortality, although child mortality fluctuated during the eighteenth century before falling sharply in the early nineteenth.

The low infant mortality rate in the sixteenth and early seventeenth century is confirmed by Finlay's research on four parishes: the uncorrected rate for this period was as follows: All Hallows Bread Street, 1538–1653: 83/1,000; St Peter Cornhill, 1580–1650: 107/1,000; St Christopher le Stocks, 1580–1650: 55/1,000; St Michael Cornhill, 1580–1650: 109/1,000.[23] The equivalent uncorrected rate for the total Boyd

TABLE 5

Infant mortality (per 1,000) in the city of London, 1539–1849

Period	Total sample				Elite families			
	Number of baptisms	Infant burials	Same-name ratio	Infant mortality rate (per 1,000)	Number of baptisms	Infant burials	Same-name ratio	Infant mortality rate (per 1,000)
1539–99	839	84	48/31	155	485	38	48/31	121
1600–49	1073	191	83/62	238	610	101	83/62	222
1650–99	1020	177	99/67	256	465	82	99/67	261
1700–49	704	165	68/39	409	194	47	68/39	422
1750–99	720	138	22/16	263	–	–	–	–
1800–49	199	20	22/16	138	–	–	–	–

TABLE 6

Child (1–4) mortality (per 1,000) in the city of London, 1539–1849

Period	Total sample				Elite families			
	Number of children (1–4) at risk	Child (1–4) burials	Same-name ratio	Child mortality rate (per 1,000)	Number of children (1–4) at risk	Child (1–4) burials	Same-name ratio	Child mortality rate (per 1,000)
1539–99	616	67	48/31	168	404	35	48/31	134
1600–49	770	129	83/62	224	485	69	83/62	190
1650–99	686	131	99/67	282	340	67	99/67	291
1700–49	387	39	68/39	176	131	18	68/39	240
1750–99	435	85	22/16	269	–	–	–	–
1800–49	102	9	22/16	121	–	–	–	–

sample for 1539–1649 is 131/1,000, indicating that the latter is not an understatement of London's infant mortality in this period.

Given the unexpected finding of a marked increase in infant and child mortality from the sixteenth to the middle of the eighteenth century, a special reconstitution study was carried out for the parish of St Bartholomew's for the period 1618–1849 (Table 7).

There was no overall change in child mortality between 1618 and 1749, but a sharp increase in infant mortality — from 191/1,000 to 342/1,000 — confirming at least in part the findings from the analysis of the Boyd data. There were also marked falls in infant and child mortality after 1750, similar to those found in Tables 1, 5 and 6. However, the proportion of infants traced through to the age of five was significantly less in the St. Bartholomew's than in the Boyd sample, and this is probably because the latter included a large proportion of permanent householders.

There is also the problem of increasing birth-baptism intervals which occurred in the eighteenth and early nineteenth century. The St. Bartholomew's the Less baptism register contains information on dates of birth and baptism for the period 1650–1812 (Table 8).

The proportion of infants baptised within two weeks of birth fell steadily throughout the eighteenth century. This creates a problem of measuring neonatal mortality, as

TABLE 7

Infant and child mortality in St Bartholomew's the Less, London, 1618–1849

Period	Number of infant baptisms	Number of infant burials	Number of children (0–4) at risk	Number of child (0–4) burials	Same-name ratio	Corrected infant mortality rate per 1,000	Corrected child mortality rate per 1,000
1618–1649	328	45	143	29	25/18	191	282
1650–1699	592	100	224	37	57/37	260	254
1700–1749	564	103	202	30	60/32	342	278
1750–1849	371	32	148	9	15/10	129	91

These figures are derived from the St. Bartholomew's parish register in the Society of Genealogists' library.

TABLE 8

Birth-baptism intervals in St. Bartholomew's the Less, 1650–1812

Period	Under two weeks		Above two and below six weeks		Above six weeks		Total number with information on birth-baptism intervals	Total number of cases
	Number	%	Number	%	Number	%		
1650–99	520	89	57	10	6	1	583	912
1700–49	427	57	320	43	6	1	753	1,043
1750–99	100	22	319	70	38	8	457	527
1800–12	1	1	46	65	24	34	71	80

These figures are derived from the St. Bartholomew's parish register in the Society of Genealogists' library.

many infants would have died before baptism without being registered in the burial register (under canon law unbaptised children were not members of the Anglican Church and were therefore not formally allowed to be buried by it). This is a form of burial under-registration which cannot be measured by the same-name method. However, it has been estimated that nationally approximately 5 per cent of infants died before baptism in the period 1838–1844,[24] which in London would represent about a third of all infants dying in the first year. Some clergymen baptised infants known to be at risk of dying, and so perhaps the lower proportion is a more accurate representation of unregistered infants. Table 8 indicates that the measurement of infant mortality using baptism and burial registers becomes progressively more difficult towards the end of the eighteenth and the beginning of the nineteenth century because of the increasing interval between birth and baptism.

It is possible to analyse infant and child mortality in St. Bartholomew's by socio-economic status. The parish register designates elite status by describing fathers as 'esquire', 'gentlemen' or 'Mr',[25] and the following table compares the mortality of this elite group with that of the non-elite population.

TABLE 9

Infant (IMR) and child (CMR) mortality in St. Bartholomew's the Less by socio-economic status, 1619–1848

	Elite group		Non-elite population	
	1619–1749	1750–1848	1619–1749	1750–1848
Number of infant baptisms	371	119	1152	256
Number of infant burials	57	19	194	13
Number of children (1–4) at risk	200	48	384	101
Number of child (1–4) burials	30	4	69	5
Same-name ratio	44/22	3/3	105/68	11/6
Infant Mortality rate per 1,000	307	160	260	93
Child mortality rate per 1,000	300	83	277	91

For the source of these data, see the St. Bartholomew's parish register in the Society of Genealogists' library.

The sample sizes are small for the post-1750 period, but the figures in Table 9 indicate that infant mortality was slightly higher in the elite than the non-elite group in both 1619–1750 and 1750–1848, and child mortality was higher in 1619–1749. This is similar to the finding on socio-economic status and mortality in Tables 5 and 6 for the period 1650–1749, but different from the conclusions in Tables 3 and 4 for 1681–1709. However, the periods and nature of the samples are different in each of the separate studies, and the mortality differences between wealthy/elite and other families are not greatly significant in any of the samples covered by the above tables.

These findings on infant and child mortality are very similar to those of John Landers on London Quakers for the period 1650–1849.

The Quakers were a relatively prosperous group and perhaps occupied an intermediate socio-economic position between the wealthy and non-wealthy groups analysed in the present article. Table 10 only covers the period 1650–1849, but the

TABLE 10

Age-specific mortality rates per thousand amongst London Quakers, 1650–1849

	Age (years)		
Cohort	0–1	1–2	2–4
1650–74	251	103	190
1675–99	263	113	132
1700–24	342	145	177
1725–49	341	143	186
1750–74	327	150	159
1775–99	231	101	141
1800–24	194	93	85
1825–49	151	77	93

Source: J. Landers, 'London's Mortality in the Long Eighteenth: a Family Reconstitution Study', *Medical History,* Supplement No. 11, (1991), 7.

overall level and pattern of mortality change is similar to that discussed earlier in this paper. Mortality under the age of two increased up to the middle of the eighteenth century, and fell in the last half of the eighteenth and first half of the nineteenth century, while later child mortality decreased mainly in the first half of the nineteenth century.

Landers' study mainly covers the area south of the river, and the evidence discussed in this article has focused on the City of London. However, both appear to have been fairly representative of London in the eighteenth and first half of the nineteenth century. There was relatively little variation in infant and child mortality between different districts in London at the beginning of civil registration, even between those with different socio-economic characteristics.

The Registrar-General published details of the mean rateable value of housing in all registration districts, allowing an analysis of the relationship between poverty and mortality at the district level. Table 11 summarises mortality by district, arranged by level of mean rateable value, in the period immediately after the introduction of civil registration.

The ten districts with the lowest rateable values — mainly in the East End of London — had the lowest infant and child mortality rates. In interpreting these findings, there is the problem of institutional mortality where deaths in hospitals and workhouses sometimes occurred outside the district of birth.[26] There appears to have been greater fluctuations in adult rather than infant or child mortality in the period 1838–44, although Farr made mathematical adjustments to allow for institutional mortality in this period.[27]

Woods found a link between poverty and infant mortality in London during the 1880s,[28] using Booth's estimates of poverty by district. The poor districts at this time were more or less the same as those in the 1840s — most being in the East End of London — so it is possible that the social class gradient in infant mortality only began to establish itself in London during the latter part of the nineteenth century. However, the evidence in this paper indicates little or no association between poverty and infant/child mortality in the period 1550–1850, suggesting that disease played a largely exogenous role in shaping London's mortality patterns. This is an important and unexpected finding which will be discussed later in the paper.

Adult mortality

Adult mortality is difficult to measure through reconstitution research because only a small proportion — usually about 10 per cent — can be traced from birth to the date of adult death. There are also formidable difficulties in establishing correct individual identity in baptism and burial registers.

Special techniques are required to assess adult mortality levels, and there are two main sources available for this purpose in London during the period 1580–1849, marriage licences and apprenticeship records. According to an analysis of a sample of 14 London parish registers, 65 per cent of marriages were by licence in the first half of the seventeenth century, a proportion which had increased to 91 per cent by 1651–1750, before declining to 31 per cent at the beginning of the nineteenth century.[29] For women

TABLE 11

Infant, child and adult mortality in London, 1838–44

Registration district	Mean annual rateable value of house property	Infant mortality per 1000, 1838–1844	Child (1–4) mortality, per 1000, 1838–44	Adult (25–44), mortality, per 1000, 1838–44
Bethnal Green	£8.1	159	54	11
Camberwell	£12.3	141	34	14
Shoreditch	£13.4	149	55	14
Bermondsey	£13.5	140	59	11
Newington	£14.1	160	47	10
Stepney	£14.8	159	50	12
St. George, Southwark	£15.4	182	63	13
Greenwich	£15.8	149	46	20
Rotherhithe	£19.9	146	59	15
Lambeth	£21.5	149	51	10
Mean Average of 10 Districts	*£14.9*	*153*	*52*	*13*
Hackney	£22.4	144	33	11
Whitechapel	£22.4	194	75	20
St. George-in-the-East	£23.6	168	66	14
Islington	£24.9	148	38	10
East & West London	£25.3	186	82	21
Clerkenwell	£25.4	155	47	11
St. Saviour & St. Olave	£27.1	188	76	35
St. Luke	£27.9	132	64	10
Kensington & Chelsea	£29.1	163	47	12
Holborn	£29.7	200	65	10
Mean Average of 10 Districts	*£25.80*	*168*	*59*	*15*
Poplar	£31.7	134	42	15
Westminster	£32.4	180	65	17
Pancras	£33.1	166	52	15
St. Giles	£47.8	188	38	12
Strand	£48.8	173	67	11
Marylebone	£57.5	167	60	14
St. James Westminster	£69	169	68	10
City of London	£77.5	151	61	11
St. George Hanover Sq.	£79.2	166	52	16
St. Martin's-in-the-Fields	£101.8	177	73	15
Mean Average of 10 Districts	*£57.90*	*167*	*58*	*14*

Source: 5th Annual Report of the Registrar General (1843), 446; *8th Annual Report of the Registrar General* (1848), 192–93; *9th Annual Report of the Registrar General, Folio Edition* (1848), 236–38.

marrying under the age of twenty-one, parental consent was required, usually by written affidavit. The majority of marriage licence allegations have survived for London, and they usually contain the following relevant information: 1. Whether father alive or dead at date of marriage. 2. If father alive, his name and place of residence. 3. If father dead, name of mother or where relevant, guardian.

TABLE 12

Spinsters marrying under 21: fathers listed as dead, London Marriage Licences

Period	Total number of cases	Number of fathers dead	Proportion of fathers dead
1600–41	696	303	44%
1661–99	1,950	901	46%
1700–49	2,500	1,171	47%
1750–89	1,937	694	36%
1840–49	500	143	29%

For the period 1600–1641, the data are based on the analysis of Bishop of London's marriage licences in Armytage, *Allegations for Marriage Licences Issued by the Bishop of London 1611–1828,* op. cit. For the periods after 1661, the figures are based on an analysis of cases selected in sequence from the start dates of the Vicar-General's marriage licence allegations deposited in the Society of Genealogists' library.

Because of uncertainty about father's place of residence — many young women who were married in London were migrants from the country — it is difficult to carry out an exact analysis of London's paternal mortality. Also, there is no reliable information on fathers' ages, although this is likely to be strongly influenced by age at marriage. The limited amount of evidence available indicates that there were no long-term changes in the mean age of male marriage during the seventeenth, eighteenth and early nineteenth centuries, suggesting that fathers' ages did not change significantly during this period.[30]

Table 12 indicates a slight rise in paternal mortality between 1600–1641 and 1700–1749, although there were fluctuations of mortality in this period — such as a rise to 55 per cent in the 1660s. This rise was probably partly due to the effect of the plague, although Table 10 includes data on fathers living and dying outside of London, who were presumably less vulnerable to plague mortality.

Overall paternal mortality was high and relatively stable during the period 1600–1749, but declined significantly and steadily from the middle of the eighteenth century onwards, falling from 47 per cent in 1700–49 to 29 per cent in 1840–49. The chronology of the fall in paternal mortality is similar to that found for infant and child mortality, although the latter more than halved between 1725–1749 and 1825–1849, whereas paternal mortality declined by about a third.

The long-term trend in paternal mortality is confirmed by independent evidence from apprenticeship records, although there is some uncertainty about the quality of data because of the potential problem of self-selection.[31] Table 13 summarises data on the London fathers of masons' apprentices.

The proportion of fathers who were dead at the date of the indenture of their sons — which took place on average at about 15 years of age — halved from 42 per cent in 1663–99 to 21 per cent in 1750–1805, a larger reduction than found in the marriage licence data, but the sample sizes of the apprenticeship data are considerably smaller.

The high paternal mortality in London at the beginning of the eighteenth century is confirmed by data from the national apprenticeship register compiled for taxation purposes. Of 373 cases listed in London and Middlesex for the period 1710–1713, 37 per cent of fathers were dead at the date of the indenture of their son, significantly

TABLE 13

Mortality amongst London fathers of indentured masons' apprentices

Date of indenture	Number of fathers dead	Total number of fathers	Proportion of fathers dead
1663–1699	94	223	42%
1700–1749	124	375	33%
1750–1805	43	202	21%

Source: C. Webb, London Livery Company Apprenticeship Registers, 27: Mason's Company 1663–1805 (1999).

higher than the percentage found in the same period for the northern rural counties of Northumberland, Rutland, Westmoreland and Yorkshire — 27 per cent (91 of 336 cases) — and in Scotland — 22 per cent (33 of 151 cases).[32]

An analysis of the socio-economic status of fathers and levels of paternal mortality indicates that mortality was higher amongst wealthy fathers. This was true both nationally and also in London, the latter indicated in Table 14.

Fathers paying the higher premiums were gentlemen, merchants and others with high socio-economic status occupations, whereas those paying lower premiums were labourers, porters and others with manual occupations.[33] Higher paternal mortality in wealthier groups is an unexpected finding, although the sample sizes are small and there are data to indicate that boys from different socio-economic groups were apprenticed at slightly different ages, affecting the period in which fathers were at risk of dying.[34] However, there is evidence that fathers' ages were probably very similar between the different occupational groups.[35] Larger samples are required before confident conclusions can be reached about the relationship between premium levels and paternal mortality.

A review of actuarial evidence from insurance companies and friendly societies found that adult mortality was higher amongst middle class than working class groups in the first half of the nineteenth century, a finding that was confirmed for some occupational groups by early census and civil registration data.[36] It is possible that the families of socio-economic elites were more vulnerable to infection through geographical mobility and contact with a greater number of disease environments, e.g. merchants travelling and trading with foreign countries. There is also evidence that life-style factors — the excessive consumption of food, alcohol and tobacco, accompanied by

TABLE 14

Mortality amongst London fathers listed in the British Apprenticeship Register, 1710–13, by amount of premium paid

Premium paid	Number of cases	Proportion of fathers dead
£9 and under	110	32%
£10–£19	93	41%
£20+	99	42%

The data are based on the analysis of the British apprenticeship register lodged in the Society of Genealogists' library.

the lack of physical activity — damaged the health of the wealthy, both in London and elsewhere.[37]

The impact of mortality on London's population

Table 15 summarises estimates of London's population during the period 1520–1851, estimates which are very approximate because of the uncertain reliability of the source material.[38]

The inverted U-pattern of growth — rapid during the sixteenth and the first half of the seventeenth century, slowing during 1650–1750, and beginning to grow more rapidly after 1750 — is similar to the pattern of infant and child mortality depicted in Tables 5 and 6. This suggests that for the period before 1650, mortality did not prevent rapid population growth as it did after the middle of the seventeenth century.[39] The exact role of mortality in shaping London's population is complex, as there are a number of other factors, including fertility and migration, which were important for population growth.

Before the widespread practice of birth control in the second half of the nineteenth century, fertility was largely shaped by patterns of nuptiality, particularly age at marriage. Although full and accurate information on marriage age in London is not available for the whole period 1550–1850, marriage licences do indicate the numbers of women marrying under the age of 21 due to the legal requirement of parental consent.

TABLE 15

Estimated population size of London, 1520–1851

Approximate date	Estimated population of London	Period	Annual percentage increase	Estimated population of England	London's population as a percentage of England's population
1520	55,000			2,600,000	2.1%
1600	200,000	1520–1600	3.3%	4,300,000	4.7%
1650	400,000	1600–1650	2.0%	5,250,000	7.6%
1700	575,000	1650–1700	0.9%	5,100,000	11.3%
1750	675,000	1700–1750	0.3%	6,000,000	11.3%
1801	960,000	1750–1801	0.8%	8,600,000	11.2%
	Greater London			England & Wales	
1801	1,117,000			8,900,000	12.6%
1851	2,685,000	1801–1851	2.8%	17,900,000	15.0%

The figures for London are taken from E.A. Wrigley, 'A Simple Model of London's Importance in Changing English Society and Economy 1650–1750', *Past and Present*, 37, (1967), 44; E.A. Wrigley, *People, Cities and Wealth* (Oxford, 1987), 162. For Greater London, see B.R. Mitchell and P. Deane, *Abstract of British Historical Statistics* (Cambridge, 1971), 19. Estimates of England's population for 1600–1801 are based on Rickman's returns of national baptisms, assuming a constant baptism rate. See Mitchell and Deane, op. cit., 5; E.A. Wrigley and R.S. Schofield, *The Population History of England, 1541–1871* (1981), 574. The estimate of English 1520 population is derived from Wrigley and Schofield, op. cit., 575.

According to figures in Table 16, nearly half of single women living in London were married under the age of 21 in the early seventeenth century, and this was one of the factors associated with rapid population growth during the period. The proportion of women marrying under 21 fell significantly during the eighteenth and early nineteenth centuries, and this may have been partly the result of the reduction in adult mortality, which allowed women to achieve desired fertility at a later age of marriage. The decline in early marriage probably contributed to the slowing of population growth, although in the long run it did not prevent a resumption of a very rapid increase in London's population during the first half of the nineteenth century, which was largely the result of the reduction in mortality.

Table 15 indicates that population increased much more rapidly in London than it did in the rest of England and Wales. It grew from 2.1 per cent of the national total in 1520 to 15.0 per cent in 1851, and some of this growth was probably fuelled by migration. Table 17 summarises data on the geographical origin of plumbers' and masons' apprentices.

Migration patterns revealed by Table 17 are confirmed by additional evidence based on apprenticeship records,[40] although data derived from marriage licences suggest a lower level of in-migration in the early seventeenth century. Bishop of London licences indicate that 61 per cent of single women in London were migrants in 1583–1586, a proportion that had fallen to 53 per cent in 1601–1605, and 38 per cent by 1630–1640.[41] Although lower than the proportions for apprentices, the marriage licence data confirm that in-migration was very important in London during the late sixteenth and early seventeenth century.

TABLE 16

Proportion of single women resident in London marrying under the age of twenty-one, marriage licences, 1600–1849

Period	Number of single women marrying under 21	Total number of marriages of single women	Proportion of single women marrying under 21
1600–39	188	400	47.0%
1661–99	162	400	40.5%
1700–49	138	500	27.6%
1750–99	50	500	10.0%
1800–49	28	500	5.6%

The first hundred consecutive marriages were selected at the beginning of each decade for the periods covered by Table 16. For 1600–39, the marriages were taken from Armytage, *Allegations for Marriage Licences Issued by the Bishop of London 1611–1828,* op. cit. For all subsequent periods, the marriages were selected from the copies of the Vicar General's marriage allegations in the Society of Genealogists' library. The early age of marriage at the beginning of the seventeenth century is confirmed by V.B. Elliott, 'Single Women in the London Marriage Market: Age, Status and Mobility, 1598–1619', in R.B. Outhwaite (ed.), *Marriage and Society: Studies in the Social History of Marriage* (1981). The proportion of single women marrying in London during the first half of the nineteenth century is similar to that found by the Registrar General in 1843–44: 7.7%. See the *Registrar General's Seventh Annual Report*, *1843–44* (1846), xxx, xxxi.

TABLE 17

Geographical residence of fathers of plumbers' and masons' apprentices indentured 1570–1799

Period	Number of plumbers' apprentices	Proportion of fathers residing outside London	Number of masons' apprentices	Proportion of fathers residing outside London
1570–1599	21	86%	–	–
1600–49	67	85%	–	–
1650–99	140	71%	994	68%
1700–49	129	57%	884	37%
1750–99	56	39%	347	32%

For the source material on which these figures are based, see C. Webb (ed.), *London Apprentices, Volume 33: Plumbers' Company, 1571–1800* (2000); C. Webb (ed.), *London Apprentices, Volume 27: Masons Company, 1663–1805* (1999). The figures for plumbers in the 1650–99 category are based on the period 1663–99.

The decline in the percentage of migrants among apprentices in the eighteenth century was probably linked to the slow-down in population growth in the country at large, although Table 15 indicates that there was little or no change in London's share of the national population between 1650 and 1801, suggesting that London's increase was hampered by the high infant and child mortality in this period. However, mortality fell sharply after the end of the eighteenth century, engendering a rapid endogenous growth in population with minimal inward migration.

Discussion

The reasons for the patterns of mortality discussed in this paper must be largely speculative, given the absence of detailed work on the history of disease mortality in London during this period. The more than doubling of infant and child mortality between the sixteenth and the middle of the eighteenth century was not mirrored by a similar increase in adult mortality during the same period. Early mortality appears to have increased significantly in all socio-economic groups in the period 1550–1750, suggesting that changes in the standard of living did not play a significant role in shaping mortality patterns, particularly as this was a period when real incomes were rising generally in London and elsewhere.

There is evidence that some diseases became more virulent during the period 1550–1850. Most people dying from smallpox in London during the sixteenth, seventeenth and eighteenth centuries were children, indicating that the disease was endemic, affecting everyone born in the city.[42] The case-fatality rate of smallpox in two London parishes during the sixteenth century was approximately 5 per cent,[43] compared to a case-fatality rate of about 45 per cent amongst unvaccinated children in London in the 1880s.[44] There is considerable evidence that smallpox became more fatal in London throughout the seventeenth, eighteenth and nineteenth centuries[45] — possibly as a result of the importation of more virulent strains with the growth of world trade — and this

could explain in part the increase in infant and child mortality up to the middle of the eighteenth century. Inoculation and vaccination were practised in London after that period, although it is doubtful whether they made a major impact, particularly amongst the poor, until the end of the eighteenth century.[46]

The disappearance of the plague in the 1660s does not appear to have made a significant long-term impact on mortality in London. It is possible that this was because other diseases were replacing plague as a cause of death. We have seen that smallpox was becoming more fatal to children, and this was probably true of certain other diseases. Typhus was probably introduced into England in the sixteenth century,[47] it affected adults more than children,[48] killed rich and poor alike, and became widespread in both town and countryside during the seventeenth century.[49] In London, diseases classified by contemporaries as 'fevers' increased significantly during this period. Fever and ague accounted for about 6 per cent of all deaths in Aldgate during the period 1583–1599, most deaths occurring amongst adolescents and adults.[50] According to the London Bills of Mortality, about 15 per cent of all deaths were due to fever in the first half of the eighteenth century, again most of them adults.[51]

There was a fall in the number of 'fever' deaths amongst adults in London and elsewhere during the second half of the eighteenth century,[52] and much of this reduction in mortality was probably linked to the gradual elimination of typhus infection.[53] Woollen underwear was replaced by linen and cotton garments during this period, and more effective washing — involving the boiling of clothing — was probably responsible for the progressive elimination of both body lice and typhus.

In addition to inoculation and the introduction of linen and cotton garments, there were a number of other improvements which may have helped reduce mortality, e.g. the use of colostrum in breastfeeding after the middle of the eighteenth century. However, many of these improvements would have been adopted first by the wealthy and then only later by the general population, and the evidence on the fall in mortality is that it affected all socio-economic and all age groups from the middle of the eighteenth century onwards. A study of the Bills of Mortality and parish registers which list cause of death suggests that a range of diseases diminished during the latter half of the eighteenth and first half of the nineteenth century: — smallpox, 'fevers' (probably including typhus and typhoid fever), and convulsions (probably including diarrhoea/gastrointestinal diseases).[54] Most of these are dirt diseases and it is possible that there was a transformation of the environment in the middle of the eighteenth century which had a major impact on a number of diseases. Roy Porter wrote of the 'cleaning up the Great Wen' during this period, associated with a number of Local Improvement Acts which appeared to have transformed London's overall disease environment.[55]

The economic and social consequences of London's population growth have been well-documented by Fisher, Wrigley and others.[56] London provided an expanding market for a range of agricultural and industrial commodities, and was a major centre of manufacturing activity.[57] Its national and international trade laid the foundation for subsequent industrialisation, and it acted as a focal point for the dissemination of a more cosmopolitan way of life.[58] None of this would have been possible without population growth, and the inverted U-shaped curve of economic and social development — rapid expansion between 1520 and 1650, followed by a long period of

stagnation and subsequent rapid growth at the end of the eighteenth century — would not have occurred without a similar cycle of exogenous demographic development, both in London and nationally.[59]

Conclusions

The overall conclusions to be reached on the history of mortality in London from this research are as follows:

1. Infant and child mortality more than doubled between the sixteenth and the middle of the eighteenth century in both wealthy and non-wealthy families.
2. Mortality peaked in the middle of the eighteenth century at a very high level, with nearly two-thirds of all children — rich and poor — dying by the time of their fifth birthday.
3. Mortality under the age of two fell sharply after the middle of the eighteenth century, and older child mortality decreased mainly during the late eighteenth and early nineteenth century. By the second quarter of the nineteenth century, about 30 per cent of all children had died within the first five years. This latter fall in mortality appears to have occurred equally amongst both the wealthy and the non-wealthy population.
4. There was little or no change in paternal mortality from 1600 to 1750, after which date there was a steady fall until the middle of the nineteenth century. The scale of the fall in paternal mortality was probably less than the reduction in infant and child mortality. The latter more than halved between the middle of the eighteenth and nineteenth centuries, whereas paternal mortality fell by about a third in the same period.
5. There appears to have been a minimal social class gradient in infant, child and adult mortality in London during the period 1550–1850. This is an unexpected finding, raising fundamental questions about the role of poverty and social class in shaping mortality in this period.[60]

The absence of a general link between wealth and mortality has been one of the major findings of this paper. The research has also found an inverted U-shaped pattern of long-term infant and child mortality, with mortality more than doubling between the sixteenth and the middle of the eighteenth century, before falling sharply after this period. These findings represent a radical challenge to conventional assumptions about London's mortality history. However, the explanations and implications of these demographic patterns have yet to be fully explored, and only detailed further reconstitution research on individual parishes — particularly those with information on cause of death, age and occupation in the burial register — will answer some of these outstanding questions.

We would like to thank the Wellcome Trust for its financial support which made the research in this paper possible.

Notes

[1] V. Harding, 'Early Modern London 1550–1700', *London Journal,* 20, (1995), 36; L. Schwarz, 'London, 1700–1850', *London Journal,* 20, (1995), 46–55; L. Schwarz, *London in the Age of Industrialization: Entrepreneurs, Labour Force and Living Conditions* (Cambridge, 1992).

[2] Harding, 'Early Modern London', 36.

[3] R. Finlay, *Population and the Metropolis, the Demography of London 1580–1640* (Cambridge, 1981); Harding, 'Early Modern London', 39; B. Luckin, 'Perspectives on the Mortality Decline in London, 1860–1920', *London Journal,* 22, (1997), 123–41; R. Woods, 'Mortality, Poverty and Environment', in R. Woods and J. Woodward (eds.), *Urban Disease and Mortality* (1984), 24.

[4] See for example J. Brownlee, 'The Health of London in the Eighteenth Century', *Proceedings of the Royal British Medical Society,* 18, (1925), 73–84; A.B. Appleby, 'Nutrition and Disease: the Case of London, 1550–1750', *Journal of Interdisciplinary History*, 6, (1975), 1–22; P.R. Galloway, 'Annual Variations in Deaths by Age, Deaths by Cause, Prices and Weather in London 1670–1830', *Population Studies*, 39, (1986), 487–506.

[5] W. Heberden, *Observations on the Increase and Decrease of Different Diseases* (1801); W. Ogle, 'An Inquiry into the Trustworthiness of the Old Bills of Mortality', *Journal of the Statistical Society,* 55, (1892), 442–43; A. Hardy, 'Diagnosis, Death and Diet: the Case of London, 1750–1909', *Journal of Interdisciplinary History*, 18, (1988), 387–401.

[6] For this type of individually based research, see Finlay, *Population and Metropolis,* op. cit.; J. Landers, *Death and the Metropolis: Studies in the Demographic History of London* (Cambridge, 1993).

[7] E. Chadwick, *The Sanitary Conditions of the Labouring Population* (1842); For Marx's and Engel's views on the relationship between poverty and health, see F. Engels, *The Condition of the Working Class in England* (1845); for Mayhew's discussion of the effects of poverty, see H. Mayhew, *The Morning Chronicle Survey of Labour and the Poor: the Metropolitan Districts,* 6 Volumes (Firle, 1980).

[8] For a discussion of these complex issues, see P. Razzell and C. Spence, 'Poverty or Disease Environment? The History of Mortality in Britain, 1500–1950', in M. Breschi and L. Pozzi (eds.), *The Determinants of Infant and Child Mortality in Past European Populations* (Udine, 2004); P. Razzell and C. Spence, 'The Hazards of Wealth: the History of Adult Mortality in Pre-Twentieth Century England', *Social History of Medicine,* 19, No. 3. (2006).

[9] See Harding, 'Early Modern London 1550–1700', op. cit., 36.

[10] The uncertain quality of the Bills of Mortality has led scholars to adopt significantly different correction ratios for inflating baptisms and burials into estimated births and deaths. For two very different estimates of mortality based on the Bills of Mortality, see J. Landers, 'Mortality and Metropolis: the Case of London 1675–1825', *Population Studies*, 41, (1987), 63, and R. Woods, 'Mortality in Eighteenth-century London: a New Look at the Bills', *Local Population Studies*, No. 77, (2006).

[11] Finlay, *Population and Metropolis*.

[12] Landers, *Death and the Metropolis*; R.T. Vann and D. Eversley, *Friends in Life and Death: the British and Irish Quakers in the Demographic Transition* (Cambridge, 1992).

[13] R.A.P. Finlay, 'The Accuracy of the London Parish Registers, 1580–1653', *Population Studies*, 32, (1978), 99.

[14] See J. Landers, 'Mortality in Eighteenth-century London: a Note', *Continuity and Change,* 11, (1996), 303–10.

[15] See D. Glass (ed.), *London Inhabitants Within the Walls* (1965).

[16] This material is deposited in the library of the Society of Genealogists. For details of this source, see A. Camp, 'Boyd's London Burials and Citizens of London', *Family Tree*, 1, (1985), 12; J. Beach Whitmore, 'London Citizens', *Genealogists Magazine*, March 1944.

[17] We have examined the 1695 census listing of the city of London carried out under the Marriage Duty Act, and have been unable to find any living same-name children in any of the families

enumerated. See D. Glass (ed.), *London Inhabitants Within the Walls* (1965). For an examination of other censuses and a discussion of the same-name method, see P. Razzell, 'Evaluating the Same Name Technique as a Way of Measuring Burial Register Reliability', *Local Population Studies*, 64, (2000), 8–22.

[18] The main form of wealth listed was the ownership of real estate worth £600 or more, although other categories of wealth-owners were also included.

[19] These 37 same-name children were those born before 1695.

[20] Personal communication from John Landers. According to the London Bills of Mortality, child burials under the age of two represented about 60 per cent of baptisms in the period 1728–1739, suggesting that the same-name ratios in Table 2 do not overstate the levels of under-registration of burials. See Marshall, *Mortality*, 63.

[21] Boyd's data probably includes more wealth-holders than was typical for London as a whole. Glass estimated that about 27 per cent of the population were wealth-holders paying the higher level of taxation, lower than the proportion of wealth-holders in Tables 3 and 4.

[22] B. Weinreb and C. Hibbert, *The London Encyclopedia* (1983), 167–77.

[23] Finlay, *Population and Metropolis,* op. cit.

[24] P. Razzell, *Essays in English Population History* (1994), 147.

[25] Additional research confirms the elite status of fathers given the titles of esquire, gentleman or Mr. In the two periods 1655–1670 and 1751–1812, information is given on whether people were buried inside or outside the church: 75 of 92 (82 per cent) members of elite families were buried inside the church, compared to 4 of 29 (14 per cent) servants. Of 55 people buried inside the church and located in the 1695 Marriage Duty Listing, 33 (65 per cent) were in families with £600+ fixed wealth or £50 p.a., whereas none of the 26 people buried outside and traced in the 1695 Listing were in the higher wealth category.

[26] B. Luckin and G. Mooney, 'Urban History and Historical Epidemiology: the Case of London, 1860–1920', *Urban History*, 24, (1997), 47.

[27] Ibid.

[28] R. Woods, 'Mortality, Poverty and Environment', in R. Woods and J. Woodward (eds.), *Urban Disease and Mortality* (1984), 24.

[29] P. Razzell, 'The Conundrum of Eighteenth-century English Population Growth', *Social History of Medicine*, 11, (1998), 484.

[30] According to marriage licence data, the mean age of marriage of London bachelors was 27.6 in 1630–1636 and 27.2 years in 1693–1695. The figures for 1630–1635 are based on the first 200 marriages selected from the Bishop of London marriage licences. See G.J. Armytage (ed.), *Allegations for Marriage Licences Issued by the Bishop of London 1611–1828* (Harleian Society, Volume 26, 1887). The figures for 1693–95 are derived from the first 200 marriages selected from the Vicar Generals' marriage allegations in the Society of Genealogists' library. The mean age of marriage of bachelors in England & Wales in 1867–82 was 25.8 years, but the London average was probably higher than this in the early nineteenth century. 4.3 per cent of bachelors married under 21 nationally, compared to 1.6 per cent in the metropolis in 1843–44. See the *Registrar General's 7th Annual Report, 1843–44*, xxx, xxxi; *Registrar General's 45th Annual Report, 1882,* viii.

[31] It is possible that poor widows had an incentive to place their sons into apprenticeships, although there is no direct evidence on this and any possible distortions are unlikely to have varied greatly over time.

[32] The data are based on the analysis of the British apprenticeship register lodged in the Society of Genealogists' library.

[33] See Razzell and Spence, 'Poverty or Disease Environment?', op. cit., 63.

[34] Samples taken from the national apprenticeship register for the period of 1710–1713 indicate that the average ages of apprentices in the different premium categories were as follows: £1–£5: 14.4 years; £6–£14: 14.9 years; £15+: 15.9 years. See Razzell and Spence, 'Poverty or Disease Environment?', op. cit., 63. These figures are based on an analysis of Vicar General's marriage allegations in the Society of Genealogists' library.

[35] The mean age at marriage in London does not appear to have varied greatly by social status at this time. In 1687, the mean age of marriage of London bachelors according to marriage licences was as follows: merchants, gentlemen and professionals: 26.8 years (N = 200); tradesmen and artisans: 26.4 (N = 360); mariners, servants and labourers (1687–94): 27.5 (N = 135).

[36] Razzell and Spence, 'The Hazards of Wealth', op. cit., 59, 60. See also Table 9.

[37] Ibid.

[38] Finlay and Shearer have put forward a set of alternative population figures, but these are partly based on inflation ratios applied to parish register data. These ratios are significantly different from those used in the present paper, highlighting the uncertain nature of all population estimates before the advent of the national census registration in 1801. See R. Finlay and B. Shearer, 'Population Growth and Suburban Expansion', in A.L. Beier and R. Finlay (eds.), *London 1500–1700: The Making of the Metropolis* (Harlow, 1986).

[39] For a discussion of the role of mortality in shaping population growth for the period 1650–1750, see E.A. Wrigley, 'A Simple Model', op. cit.

[40] For confirmation of the very high proportion of migrants in the early seventeenth century, see Elliott, op. cit., 84. An analysis of the records of the apprentices who acquired the freedom of the City of London indicates that the proportion of fathers living outside London fell from 77 per cent in 1673–74 (N = 200) to 14 per cent in 1822–24 (N = 99). See 'City of London Freedom Certificates', Guildhall Library, Corporation Record Office, Ref CF1.

[41] The first 200 marriages were selected for analysis in each of the periods 1583–86, 1601–05 and 1630–40 from Armytage, *Allegations for Marriage Licences Issued by the Bishop of London 1611–1828,* op. cit.

[42] See T.R. Forbes, *Chronicle from Aldgate* (New Haven, 1971); R. Hovenden, *The Register of Christenings, Marriages and Burials of the Parish of Allhallow London Wall, 1559–1675* (1878); J. Landers, 'Age Patterns of Mortality in London During the Long Eighteenth Century: a Test of the High Potential Model of Metropolitan Mortality', *Social History of Medicine*, 3, (1990), 53.

[43] Forbes found in his study of the parish of Aldgate that there were 117 deaths from smallpox out of a total of 5,309 — 2.2. per cent — during 1583–99. 83 of the 117 deaths — 71 per cent — were under the age of ten and there were 3236 baptisms in the parish during this period, indicating a case-fatality rate of about 4 per cent. See T.R. Forbes, *Chronicle from Aldgate* (New Haven, 1971). There were 12 deaths from smallpox in Allhallows London Wall during 1574–98, 10 of which were under the age of 7, and 442 baptisms in the parish during this period, indicating a case-fatality rate of under 5 per cent. See R. Hovenden, *The Register of Christenings, Marriages and Burials of the Parish of Allhallow London Wall, 1559–1675* (1878).

[44] P. Razzell, *The Conquest of Smallpox* (2003), 168, 177.

[45] Ibid. 166–78.

[46] Ibid. 74, 96, 97.

[47] H. Zinsser, *Rats, Lice and History* (New York, 1963), 279.

[48] A.J. Saah, 'Rickettsia prowazekii (Epidemic Louse-borne Typhus)', in G.L. Mandell, J.E. Bennett and R. Dolin (eds.), *Principles and Practice of Infectious Diseases,* 2, (2000), 2051; C. Creighton, *A History of Epidemics in Britain,* 2, (Cambridge, 1965), 47.

[49] Creighton, *A History*, 2, 30–33. The environmental conditions favourable to the spread of typhus appear to have been present in England well before the sixteenth century. Body lice continued to be prevalent in both town and countryside into the eighteenth and nineteenth centuries.

[50] Forbes, *Chronicle.*

[51] Vann and Eversley, *Friends*, 212–15, 234.

[52] Vann and Eversley, *Friends*, 234. Schwarz has noted the decline of mortality from fever, smallpox, consumption and the diseases of infancy in London in the eighteenth century. See L. Schwarz, 'Review Article: Death in the Eighteenth Century', *Continuity and Change*, 11, (1996), 300.

[53] Creighton, *A History*, 14.

[54] T.R. Forbes, 'Births and Deaths in a London Parish: the Record from the Registers', *Bulletin of the History of Medicine,* 55, (1981), 390; Vann & Eversley, *Friends,* 218; J. Landers and A. Mouzas, 'Burial Seasonality and Causes of Death in London 1670–1819', *Population Studies*, 42, (1988), 64.

[55] R. Porter, 'Cleaning up the Great Wen: Public Health in Eighteenth Century London', *Medical History*, Supplement No. 11, (1991), 61–75.

[56] See F.J. Fisher, *London and the English Economy, 1500–1700* (1990); E.A. Wrigley, 'A Simple Model of London's Importance in Changing English Society and Economy 1650–1750', *Past and Present,* 37, (1967), 44–70; A.L. Beier and R. Finlay (eds.), *London 1500–1700: the Making of the Metropolis* (Basingstoke, 1986).

[57] See J.A. Chartres, 'Food Consumption and Internal Trade', in Beier and Finlay, op. cit.; A.L. Beier, 'Engine of Manufacture: the Trades of London', in Beier and Finlay, op. cit.

[58] Wrigley, 'A Simple Model' op. cit.; Beier and Finlay, op. cit. Not only did the population increase in London during the sixteenth and early seventeenth centuries have economic and social consequences for the country at large, but it probably had a significant influence on political developments in the mid-seventeenth century. The City of London provided critical financial and military support for the Parliamentary cause — the City's trained bands constituted the core of the early Parliamentary army. See S. Porter (ed.), *London and the Civil War* (Basingstoke, 1996).

[59] There is evidence that the cyclical fluctuations in mortality in London were also found in the country at large. See P. Razzell, 'Population, Poverty and Wealth: The History of Mortality and Fertility in England, 1550–1850', *Population and Disease: Transforming English Society, 1550–1850* (London, 2007).

[60] For a discussion of the role of wealth in shaping adult mortality, see Razzell and Spence, 'The Hazards of Wealth', op. cit.

Peter Razzell is a Research Fellow at Essex University. His recent publications include 'Social capital and the history of mortality in Britain' in *International Journal of Epidemiology* (2005); 'Life and death in Bedfordshire: early research findings' in *Bedfordshire Family History Society Journal*, 15 (2005); 'The hazards of wealth: adult mortality in pre-twentieth-century England', in *Social History of Medicine* (December 2006) [with Christine Spence]; 'An evaluation of the reliability of Anglican adult burial registration' in *Local Population Studies* (December 2006), and *Population and Disease: Transforming English Society, 1550–1850* (London, 2007).

Christine Spence is a researcher in the Department of History of Essex Univerity. Her recent publications include 'The hazards of wealth: adult mortality in pre-twentieth-century England' in *History of Social Medicine* (December 2006) [with Peter Razzell]; 'Poverty, birth weight and infant weight gain in Hertfordshire, 1923–39' in *International Journal of Epidemiology* (December 2004) [with Peter Razzell and Karen Vines].

The evaluation of Bedfordshire burial registration, 1538–1851

Peter Razzell, Christine Spence and Matthew Woollard

Abstract

This article is based mainly on a digital transcript of burials for 126 Bedfordshire parishes 1538–1851, and a county index of wills for the same period. The comparison of probate with burial register data indicated that there was little long-term change over time in burial under-registration, with between 21 and 27 per cent of will entries missing in the registers. There was also little variation between parishes of different population sizes, suggesting that burial under-registration was predominantly a random process linked to clerical negligence. A comparison of 1841 and 1851 census data, linked to the Bedfordshire burial database, revealed that missing burials amongst married couples was 29 per cent, similar to that found in the probate/burial register comparison in the 1840s. These findings on the adequacy of burial registers suggest that similar research on others counties will be necessary in order to establish reliable conclusions about England's population history.

Introduction

One of the major issues of historical demography has been the reliability of Anglican parish registers and its relationship to English population history in the period 1538–1850.[1] Assumptions about the reliability of registers have had a major effect on the interpretation of population change, and this has had a significant impact on the debate about the nature of population growth during the 'parish register period'. Much of the uncertainty about demographic change is due to the inflation factors used for the correction of missing births and deaths in the eighteenth and early nineteenth centuries. One set of assumptions suggests that an increase in fertility was the prime factor in eighteenth century population growth,[2] whereas other inflation ratios have indicated that reduced mortality was the most important variable.[3]

In order to obtain reliable inflation ratios it is necessary wherever possible to establish independent measures of births and deaths through comparison with alternative sources, allowing objective estimates of the accuracy of coverage of these events.[4] The reliability of

1 E.A. Wrigley and R.S. Schofield, *The population history of England, 1541–1871: a reconstruction* (London, 1981); P.E. Razzell, *Essays in English population history* (London, 1994); E.A. Wrigley, R.S. Davies, J.E. Oeppen and R.S. Schofield, *English population history from family reconstitution, 1580–1837* (Cambridge, 1997); P.E. Razzell, *Population and disease: Transforming English society, 1550–1850* (London, 2007).

2 Wrigley and Schofield, *Population history of England.*

3 Razzell, *Essays;* Razzell, *Population and disease.*

4 Razzell, *Essays*, 82-149; Razzell, *Population and disease*, 1-39.

the coverage of baptism registration has been previously assessed through the comparison of census statements of birthplace and age with baptism register entries, and a number of studies have been carried out on individual parishes for the period 1760–1850.[5] Additionally, research has been conducted on the reliability of burial registration coverage by using the same-name technique and comparing information in probate and poor law records with that in burial registers.[6] Most of these studies have been based on a limited number of parishes because of the time-consuming nature of the research. The overall conclusion from this research is that between a quarter and a third of both births and deaths were missing from baptism and burial registers, and there was little or no variation over time during the eighteenth and early nineteenth centuries.[7]

As a part of a wider project on the quality of digital transcripts of Bedfordshire parish registers, the authors have drawn on an unprecedented selection of materials for research on burial registration reliability. In addition to research on registration coverage, these materials will also allow the study of the accuracy of burial registers, by comparing the details of entries in alternative sources.

Sources used in the research

Bedfordshire Family History Society burial database

The database includes a total of 344,989 burials for the period 1538–1850, providing details of parish, name of person, date of burial, names of parents where available, and all other information, such as occupation, age and address, recorded in the original registers.[8]

This database was created to enable family historians to search for individual ancestors and not for the purposes of demographic research. This is particularly relevant when making comparisons of counts of events from different sources. The Bedfordshire Family History Society (BFHS), for example, sometimes transcribed as separate records the following items in the parish register: alias names, name variants between original registers and bishops' transcripts, and the surnames of both parents of illegitimate children. This duplication of events artificially inflates the number of entries in this dataset, which must be allowed for in any comparison of counts.

This database is based on the published parish register transcriptions initially carried out by F.G. Emmison and colleagues at the Bedfordshire Record Office in the 1930s to 1950s,

5 E.A. Wrigley, 'Baptism coverage in early nineteenth century England: the Colyton area', *Population Studies*, 29 (1975), 299–316; Razzell, *Essays*, 82–149.

6 Razzell, *Population and disease*, 3–39.

7 Razzell, *Essays*, 82–149; Razzell, *Population and disease*, 1-39.

8 The Bedfordshire Family History Society kindly made this database available for the project on which this paper is based. For further details see the research report to the ESRC: Peter Razzell, Christine Spence and Matthew Woollard 'Evaluation of a digital transcription of English parochial registers, 1538–1851: a pilot study. Research Report', Reference Number RES–000–22–2215 (2008).

rather than the actual registers.[9] It seems that Bedfordshire was the first county to complete a transcription of its parish registers, with the last volume being published in the 1980s. Emmison, the deputy archivist for Bedfordshire, was one of the outstanding archivists of this period, and his colleagues used not only surviving original registers but also copies of bishops' transcripts deposited in the county record office, collating different entries and publishing details of name differences and other variants. For the post-1812 period, the BFHS burial database used the original parish registers deposited in the Bedfordshire County Record Office.

British Record Society index of probate materials

The authors created a database of the published index to the probate records of the Archdeaconry of Bedford—covering primarily the county of Bedfordshire—for the period 1484–1858.[10] The original index was compiled by archivists and volunteers working at the Bedford Record Office, with detailed knowledge of Bedfordshire records and local history. This index suffers (and indeed benefits) from being organised by surname variant. Thus 37 individuals are listed under the surname heading of 'BISHOP, BYSSHOPP' with no indication of the different spellings identified in the original documents. Furthermore, reported first names have been standardised, often to abbreviations. A limited attempt has been made in this study to assess the accuracy of this probate material, but the prime aim of the research was to compare the details of probate entries with those in burial registers in order to carry out an independent assessment of the reliability of burial registration coverage.

Cambridge Group for the History of Population and Social Structure data

This dataset contains monthly and yearly aggregative counts of burials for 20 Bedfordshire parishes.[11] These counts normally covered the period from the beginning of available parish registration up to the year 1812, the end date for which published parish registers were available.

Published data

This research has used population data from the pre-1851 census reports,[12] including

9 A total of 80 volumes of parish register transcripts were published, commencing in 1931.

10 See J. Stuart and P. Wells eds, Alan F. Cirket, comp., *Index of Bedfordshire probate records, 1484–1858* (London, 1993–1994), British Record Society, vols 104 and 105. We are grateful to the BRS which gave us permission to scan these books and to use them for research purposes.

11 This data, known colloquially as the '404' data. are lodged at the UK Data Archive: R.S. Schofield, and E.A. Wrigley, *Parish register aggregate analyses, 1662–1811; 404 Data* [computer file]. Colchester, Essex: UK Data Archive [distributor], April 2003. SN: 4491. A CDRom containing the data and an explanatory pamphlet is available from the *Local Population Studies* General Office. As a result of the collaborative effort necessary to create this dataset, we describe them as Cambridge Group data.

12 This data is published in: 1801 Census of Great Britain, *Parish register abstract, 1801*, BPP 1801–02 VII (112); 1811 Census of Great Britain, *Parish register abstract, 1811*, BPP 1812 XI (317); 1821 Census of Great Britain, *Observations, enumeration and parish register abstract, 1821*, BPP 1822 XV (502); 1831 Census of Great Britain, *Parish register abstract, 1831*, BPP 1833 XXXVIII (149); 1841 Census of Great Britain, *Abstract of the answers and returns made pursuant to Acts 3 and 4 Vic. c.99 and 4 Vic. c.7.... Parish register abstract, 1841*, BPP 1845 XXV (623).

information on the number of burials in the ten Bedfordshire hundreds for the period 1700–1812.[13] It has also drawn upon indexed versions of the 1841 and 1851 Bedfordshire censuses.[14]

Preliminary analysis: accuracy of the transcripts

Transcription accuracy: frequency method for the period to 1812

Our first check on the accuracy of the BFHS database was to compare it with the original manuscript registers. As it was impossible to compare all events between the two sources we constructed a sample for comparison. In order to construct the sample, we worked our way forward in sequence through the parishes in the published volumes of the Bedfordshire registers, selecting the first available year for burials, and then worked forward to fill the next available slot. In order to cover all the 124 parishes in the dataset, we selected every second year in the period 1565–1811.[15] Years were not chosen where there was an indication in the published register that registration had broken down in that period, and the earliest available year was then selected after the breakdown of registration.

Having selected the sample of parishes and event years, we compared the count of burials in the BFHS database with those in the published register volumes for each parish year.[16] Overall, the count of burials was very consistent—1,190 in the parish registers and 1,201 in the BFHS database—a difference of 11 (1 per cent), suggesting that the database is of a very high quality.

Transcription accuracy: alphabetic method, for the period to 1812

Using the sample constructed for the frequency method analysis, we selected from the published parish registers the first 20 burials, starting at the beginning of the sample year for each of the 124 parishes. If this number of events were not available at the end of the period terminating in 1812, the appropriate number was selected by counting backwards from the end date.

13 For sources see the previous footnote. A hundred is (for administrative, judicial and military purposes) a sub-division of an Ancient County. Throughout our research considerable care has been taken to ensure that comparisons between different sources relate to identical geographic units. The administrative geography of Bedfordshire is reasonably straightforward, but a number of places designated as Bedfordshire parishes at different historical periods—Tilbrook, Eggington, Kensworth, Everton, Heath and Reach, and Bedford Holy Trinity—were excluded from the research because of date truncation, relocation of parishes to other counties, and hamlets within parishes becoming parishes in their own right. Early nineteenth-century census reports were used to construct the information on the administrative geography of Bedfordshire. For details of these areas see the Appendix to the report to the ESRC, 'Evaluation of a digital transcription', 63–72.

14 We used Ancestry and the S&N Genealogy digital indexes for this purpose.

15 The published parish registers which were used in this phase of the research ended in 1812.

16 In the BFHS database burials of illegitimate children were often transcribed twice, separately under the surnames of the father and mother. Likewise individuals with alias surnames were transcribed twice under both names. These duplicates were removed for the purposes of counting burials for comparison.

There were four cases in the 2,480 burials in the burial register sample that could not be traced in the BFHS database, three of which had no surname listed in the original register. There were eight cases transcribed twice, mainly because of variants in names between the original parish register and the bishops' transcript. There was therefore a net difference of four cases between the published registers and the digital transcript, representing 0.4 per cent of the total. Additionally, there were only 20 defective cases (1 per cent) with minor spelling variations and other errors. Overall, the quality of the BFHS digital burial records was very high.

Transcription accuracy: comparison of the BFHS database with the Cambridge Group data

The Cambridge Group's aggregative sample includes 28 Bedfordshire parishes, and detailed data are available for the present research on 20 of these.[17] A comparison has been made of the number of burials in this dataset with those in the BFHS database. The analysis was limited to the period terminating in 1812, in order to allow for additional checks in the original published parish registers.

Comparisons were confined to years with at least one event entry, as there were a number of years in which there were BFHS burials but no entries in the Cambridge Group dataset. Most of these nil entries occurred at the beginning of the data series in the sixteenth and seventeenth centuries, and the reasons for their absence are not clear. Also excluded from the analysis were estimated counts, mainly in the Commonwealth period.

The overall level of exact matching of numbers of burials is high: 77.1 per cent of monthly counts. However, there were count deficiencies in the Cambridge Group data resulting from the under-counting of burials. In the three parishes of Campton, Chalgrave and Toddington the number of transcribed burials is identical, and in one parish, Woburn, there are slightly fewer burials reported in the BFHS database than in the Cambridge Group dataset. In the remaining 14 parishes there are more burials in the BFHS database than in the Cambridge Group dataset—varying between 0.9 and 3.4 per cent of the total BFHS number—which suggests that there was some degree of under-counting in the Cambridge Group data.

There was a total of 60,461 burials (excluding duplicates) in the BFHS database compared to 59,908 in the Cambridge Group dataset—a difference of 553, or less than one per cent of the total of recorded burials in the former. The slight difference between the Cambridge Group dataset and the other transcripts demonstrate how even the most carefully prepared and painstaking calculations of aggregate figures will differ.

Transcription accuracy: comparison with John Rickman's data

In the 1801 *Parish register abstract* returns John Rickman published the totals of baptisms and burials for the decennial years between 1700 and 1760 and individual years between

17 The parishes are Ampthill, Blunham, Bolnhurst, Campton, Chalgrave, Cranfield, Kempston, Maulden, Millbrook, Northill, Pavenham, Pulloxhill, Riseley, Sandy, Souldrop, Studham, Thurleigh, Tingrith, Toddington and Woburn.

1780 and 1800 by hundred.[18] Each of these returns stated the parishes which were under observation along with comments about the levels of defectiveness of each parish return. For defective hundreds Rickman commented that '[T]hese Defects are, throughout, supplied by stating, for every such Parish, in every such Year, an Average'.[19] The nature of this average remained unstated, making it impossible to compare data in the parishes/ years in question.

There were nine hundreds and one borough in Bedfordshire which were relatively stable in their constituent parishes.[20] For the burials reported in the 1801 census, five of the ten Bedfordshire hundreds had no noted defects, but one (Clifton) contained the parish of Holwell which was later allocated to Hertfordshire Registration County and consequently not included in the BFHS database. For the four remaining hundreds, we compared the number of burials for all the years covered by the census report.[21] It is unclear whether the clergymen when making their returns used the Old Style (OS) or New Style (NS) dates before 1752, and so Table 1 includes calculations using both styles.[22] We compiled the figures for the OS dates by calculating years from 1 April to 31 March, which was the data available in our monthly/yearly counts. This separation into OS and NS may remove some of the problems relating to this analysis, but there is no way of telling whether the parish totals aggregated by Rickman were based on one, the other, or both styles. To make comparisons more meaningful, Tables 1 and 2 show the results by grouped years.[23]

In nearly every one of the four hundreds there are considerably more burials in the BFHS data than in Rickman's returns in the first half of the eighteenth century, but a strong convergence in proportions by the end of the century. Local considerations may also need to be taken into account, and even wide-ranging research such as this is not able to examine all the causes of these differences. The discrepancies in Rickman's figures may occur for a very wide range of reasons. Most notably, the clergymen reporting the figures may have excluded burials where the deceased was from a different parish.[24] Furthermore, it is not impossible that infant (and bastard) deaths were not considered by some of the clergy as within Rickman's purview.[25]

18 1801 Census of Great Britain, *Parish register abstract, 1801*, BPP 1801–02 VII (112).

19 These words, or similar, are used throughout the 1801 Census of Great Britain, *Parish register abstract*. We have quoted from page 1.

20 Henceforth we describe the borough of Bedford as a hundred.

21 For earlier independent comparisons see: E.A. Wrigley, 'Checking Rickman', *Local Population Studies*, 17 (1976), 9–15; W.J. Edwards, 'National parish register data: an evaluation of the comprehensiveness of the areal cover', *Local Population Studies*, 17 (1976), 16–24 and W.J. Edwards, 'National parish register data: a re-aggregation of John Rickman's marriage returns', *Local Population Studies*, 17 (1976), 25–41.

22 See Wrigley and Schofield, *Population history of England*, 613.

23 For the total number of cases in all four hundreds see Appendix B in the report to the ESRC 'Evaluation of a digital transcription'.

24 Wrigley, 'Checking Rickman', 10.

25 J. Rickman, 'Concerning the defects and results of English parish registers', *London Medical Gazette*, XVII (1836), 436–43 is not enlightening on the subject, but notes high levels of female mortality in Bedfordshire, and provides limited evidence of Rickman's early life.

Table 1 **Proportion of burials in the BFHS database compared with Rickman's data, four Bedfordshire hundreds**

Hundred	Year	BFHS burials divided by Rickman burials, OS (%)	BFHS burials divided by Rickman burials, NS (%)
Barford	1700/1710	97	109
	1720/1730	117	139
	1740/1750	118	122
Willey	1700/1710	119	121
	1720/1730	106	115
	1740/1750	105	107
Bedford	1700/1710	104	112
	1720/1730	106	116
	1740/1750	92	116
Wixamtree	1700/1710	142	139
	1720/1730	124	143
	1740/1750	124	119
Total	1700/1710	116	121
	1720/1730	113	127
	1740/1750	109	115

Source: Bedfordshire Family History Society Burial Database and Census of Great Britain, *Parish register abstract*, 1801, BPP 1801-02 VII (112).

Note: OS = old style dates; NS = new style dates.

Table 2 **Proportion of burials in the BFHS database compared with Rickman's published data, four Bedfordshire hundreds**

Hundred	Year	BFHS burials divided by Rickman burials (%)
Barford	1760/1770	112
	1780–1790	107
	1791–1801	82
	1802–1810	94
Willey	1760/1770	97
	1780–1790	104
	1791–1801	101
	1802–1810	84
Bedford	1760/1770	114
	1780–1790	107
	1791–1801	104
	1802–1810	101
Wixamtree	1760/1770	128
	1780–1790	108
	1791–1801	103
	1802–1810	106
Total	1760/1770	110
	1780–1790	106
	1791–1801	99
	1802–1810	95

Source: Bedfordshire Family History Society Burial Database and Census of Great Britain, *Parish register abstract*, 1801, BPP 1801-02 VII (112); Census of Great Britain, *Parish register abstract*, 1811, BPP 1812 XI (317).

Wrigley and Schofield compared the returns for six hundreds from elsewhere in the country made up of single parishes in their own data. They concluded that the 'differences in the overall totals [in the eighteenth century] … between Rickman's returns and the Group's returns amount to 0.34 per cent for baptisms, 0.92 per cent for burials, and 0.22 per cent for marriages. None of these is large enough to be a cause of misgivings about the parish register returns in the 1801 census if it is safe to assume that the six parishes are representative of the mass of parishes in general'.[26] Tables 1 and 2 suggest that this conclusion is not valid for all areas of England. It is possible that there was a difference between hundreds which were single and multiple parishes—each of these four hundreds were composed of multiple parishes[27]—but this is a topic that requires further clarification.

The comprehensiveness of demographic events: comparing probate records with burial register data

The Bedfordshire probate database (see above, p. 33) covers the whole county of Bedford and includes information on name, occupation and status, parish of residence and date of probate. The database contains a total of 31,917 entries, representing approximately 9 per cent of all burials. However, the probate data and the register data cover slightly different periods and slightly different geographical areas. The probate database also relates almost exclusively to adults whereas the registers include children. Any comparison between the two sources needs to take the first two of these points into consideration, and remember that any results reflect the registration of the adult (and predominantly male) population.

Choosing cases for comparison

In order to consistently compare the probate entries and the burial records we 'edited' the probate list to include only eligible entries. The first series of edits was to exclude from observation cases before 1538, cases with no listed parish, cases with no name, cases from outside Bedfordshire, cases from the Liberty of Chicksands and, lastly, cases which were duplicated through repetitions in wills and admonitions, or for other reasons where only one record was selected. These edits were designed to maximise any links between the two datasets, and allow us to report a minimal level of under-registration. The second series of edits was designed to take account of periods in which burial registration was inactive, as attempting to link records between the probate and the burial databases during periods when registration was inactive will only overstate under -registration and ignore non-registration. Thus, the figures which we suggest below for under-registration will be an absolute minimum.

There were periods when both baptism and burial registration ceased completely, particularly during the Civil War and Interregnum, but there were other times when

26 Wrigley and Schofield, *Population history of England*, 619.

27 The parochial composition of the hundreds can be found by using Appendix A in the report to the ESRC 'Evaluation of a digital transcription'.

baptism registration ceased but burial registration continued, and vice versa. There is no completely objective method of establishing parish registration activity, and so an assumption was made that in order to establish the presence of registration, at least one burial should be registered in any one individual year.[28]

This elimination of years without burial entries leads to an under-estimate of parish registration inadequacy, as some blank years would have been the result of burial under-registration rather than the non-existence of parish registration. However, most blank years occurred in very small parishes, with 19 parishes having sizeable multiple gaps in the period 1538–1850, all with populations of 200 or less in 1801.[29] Assuming burial rates lay within the range of about 25 to 45 per 1,000 in this period, we would expect on average between about two to four burials per year in these very small parishes with populations less than 100, although statistical variance would generate some genuine zero entries for individual years. However, there were only 3,152 burials in these very small parishes: 0.9 per cent of the total. The remaining 11 small parishes, with populations of less than 200 in 1801, also had only a low proportion of the number of burials: 1.7 per cent of the total.[30]

The assumptions used for the matching of probate with burial register data diminish the problem of blank years. A five-year period previous to the probate date was assumed in order to allow for the delay between probate and the date of burial.[31] In order to qualify for the matching exercise, it is therefore necessary for a burial register to have at least one burial entry in this five-year period, and most small parishes have few periods which meet these criteria.

The proportions of eligible probates rise noticeably with the size of parishes, with negligible percentages in the smaller parishes and substantial majorities in the larger ones.[32] The six parishes with populations of less than 100 represented 1.2 per cent of the total of number of ineligible probate records, and 0.4 per cent of the eligible ones. The comparable proportions for the 18 parishes with populations of less than 200 are 2.1 per

28 The Cambridge Group developed a computer program to estimate and correct for the number of missing baptisms, marriages and burials due to the complete breakdown of parish registration, such as occurred during the Civil War period. They estimated that about 5 per cent of all burials were missing in 1539-1836 on account of defective registration, mainly in the period before 1700. See Wrigley and Schofield, *Population history of England*, 545-52. Although not strictly comparable, over 90 per cent of Bedfordshire burial registers had more than 5 per cent of blank years, suggesting that 'the blank year' method is cautious in its assumptions about the number of missing burials due to the breakdown of parish registration.

29 Of these parishes 12 (Battlesden, Billington, Chellington, Clapham, Cockayne Hatley, Lower Gravenhurst, Knotting, Potsgrove, Shelton, Souldrop, Upper Stondon and Whipsnade) had a reported population in 1801 of between 100 and 200 and seven (Holcutt, Farndish, Little Barford, Astwick, Eyworth, Edworth and Higham Gobion) a reported population of less than 100.

30 The number of burials is 6,013.

31 This methodology has previously been used in P.E. Razzell, 'An evaluation of the reliability of Anglican adult burial registration', *Local Population Studies*, 77 (2006).

32 The proportion of edited cases for the town of Bedford is lower than expected because it includes a number of parishes, and a small gap in burial coverage in any one parish diminishes the proportion of eligible cases.

cent and 3.8 per cent. This indicates that the problem of gaps in the smaller parishes is not important, as the data for these small parishes only represents a very low proportion of the total.[33] The elimination of blank years from the research will lead to an under-estimation of missing burials, as undoubtedly some deaths would have occurred during these years even in very small parishes. However, it has the advantage of providing an objective procedure which errs on the side of caution in not over-estimating the degree of burial under-registration.

The linking of probate and burial register data requires the careful formulation of matching criteria. Three variables are available for the establishment of matches: name; parish of residence/burial; date of probate and burial. The assumptions made for the matching of cases may be summarised as follows: first, the names of people in the probate and burial records should be identical, although this is subject to phonetical variations.[34] Second, the parish of residence in the probate document should be the same as the parish of burial, except where a different abode and burial parish are indicated in the burial register. Third, we have assumed that a matched case must be within the qualifying five year period before the date of probate.

It is worth noting at this point that this final criterion might be considered to be contentious, as the assumption that a burial could occur up to five years prior to the date of probate could lead to an over-matching of data. We have evaluated this by looking in detail at a smaller sample taken from a 1630/1 list of Bedfordshire will abstracts,[35] which usually gives information on the date of the will—that is, when the person was still alive, and the date of probate when he or she was dead. There were 211 cases with information on date of will and probate in this list, and the median interval between the two dates in 1630/1 was 2.5 months. The median intervals for the different matching categories were:

Matched: 2 months (N = 143);
Unmatched: 3.5 months (N = 32);
Other, that is, insufficient information to attempt a match: 2.5 months (N = 36).

Information from 1630/1 indicates that probate occurred very soon after the date of death, and this was true of both matched and unmatched cases. However, seven of the 211 cases had intervals of over five years, suggesting that it was only infrequently that probate took place over five years after death. We have assumed that this marginal 'loss' through the five-year rule for eligibility will be more than countered by removing the possibility of 'gain' by incorrect matching.

33 For full details see report to the ESRC, 'Evaluation of a digital transcription'.

34 A single exception to this rule is where a woman is given the "first name" 'widow' in the burial register, and a candidate probate record gives a different first name, with the status widow.

35 See A.T. Clarke ed., *Abstract of Bedfordshire wills, 1630-31, prepared for the County Record Office* (1981), in the Society of Genealogists library.

It is possible to partly assess the accuracy of matching by comparing the date of burial with the date that a will was made and probated. Seven of the 143 matched cases (4.9 per cent) had burial dates before the date of the will, indicating incorrect matches: in effect 5.1 per cent were false positives. There were probably other such cases, but given the narrow wills/probate date median interval, they are unlikely to have been substantial. The median interval probably increased during the eighteenth century to more than six months as a result of falling adult mortality. The effects of this will require further research on manuscript probate documents.[36]

Where there was ambiguity in the linking process, additional information was used to clarify matches. This includes data on occupation, family status and the dates of probate and burial. For example, where a man was listed with an occupation in the probate records but described as a son, child or infant in the burial register, this was considered as grounds for rejecting the matching of a case, even though all other criteria were met. Similarly, where a woman was listed as a widow in the probate database, but as a wife, spinster, daughter, child or infant in the burial record, the linkage of records was rejected. However, where a woman was returned as a spinster or maid in the list of probates but as a spinster or daughter in the burial register, this was considered a basis for a matched case.

Where there were two or more cases meeting all the above criteria, the case nearest in time to the date of probate was selected as a match. It was assumed that no two matched cases between probate and burial records should use the same burial entry and, where this occurred, the case with the closest date match was selected, and the second case was considered as unmatched. All unmatched cases were compared on an individual parish basis, both through the burial database index and a manual examination of names in the burial listing. All 22,044 eligible cases in the probate database were compared manually with individual parish records, ensuring maximum quality of outcome.

There is evidence that some people were buried outside their parish of residence (sometimes known as the 'traffic in corpses') and in effect this constitutes a form of migration. The wills themselves provide some information on this. A transcript of Bedfordshire wills for the period 1484–1533 has been made by Patricia Bell, and the first 100 cases for 1510–33 with information on intended parish of burial indicates that only one was outside the parish of residence.[37] Similarly, according to the 1630/1 list of Bedfordshire will abstracts, two out of 54 people leaving wills requested that they be buried in outside parishes.[38] These samples suggest that between one and 4 per cent of burials occurred

36 The website Surrey Plus Wills Index has transcribed some Bedfordshire wills for the period 1607–1831. The median interval between burial and probate for this sample of 61 will abstracts was 6.5 months. See: http://www.rootsweb.ancestry.com/~engsurry/bdf.htm [Accessed 11 April 2008].

37 Patricia Bell, *Bedfordshire wills, 1484–1533* (Bedford, Bedfordshire Historical Record Society, 1997).

38 Clarke ed.. *Abstract of Bedfordshire wills, 1630-31.* There were seven cases in this 1630/1 wills abstract sample with information on intended parish of burial which could not be matched against burial registers. In all seven cases the intended parish of burial was the same as parish of residence.

Table 3 The matching of Bedfordshire probate and burial records by half-century, 1543–1849

Period of Probate	No. unmatched	No. matched	Total	% unmatched
1543–99	159	451	610	26.10
1600–49	777	2,954	3,731	20.80
1650–99	1,188	3,438	4,626	25.70
1700–49	1,413	4,617	6,030	23.40
1750–99	839	2,905	3,744	22.40
1800–49	894	2,409	3,303	27.10
Total	5,270	16,774	22,044	23.90

Source: Stuart and P. Wells eds, Alan F. Cirket comp., *Index of Bedfordshire probate records, 1484–1858* (London, 1993–1994), British Record Society, 104 and 105, Bedfordshire Family History Society Burial Database.

outside the parish of residence. However, the 588 cases with different parish abodes and burials were included in the file of matched cases, and as we have seen the undetected 'traffic in corpses' was probably of the order of less than 5 cent of all burials.

There is too much uncertainty about the scale of false positives and false negatives to put exact figures on burial under-registration for the probate sample, but these errors are unlikely, on the basis of the evidence reviewed, to be much greater than plus or minus 5 per cent. The evidence reviewed suggests that there were probably more false positives (perhaps of the order of 5 per cent) than false negatives (perhaps of the order of 2 per cent).

The results of the matching exercise by half-century are summarised in Table 3. Overall, Table 3 shows that almost 24 per cent of the individuals in the probate index did not have a corresponding burial record. This result should be tempered by the discussion of false positives and false negatives above, which on balance will probably result in an under-statement of the proportion of unmatched cases.

There was no long-term trend in the proportions of unmatched cases over time, but variations occurred within the range 21–27 per cent. Further clarification of trends can be illuminated through a detailed breakdown by decade, which is shown in Table 4.

About 20 per cent of probates were unmatched in the first four decades of the seventeenth century, but the figure rose to 30 per cent in the post-Civil War period. This suggests that the breakdown in parish registration in the 1640s and 1650s—evidenced by the sharp decline in the number of probates eligible for matching—had weakened burial registration in the 1660s and 1670s. Registration improved in the 1680s and 1690s, but fluctuated in the eighteenth century, with between 20 per cent and 25 per cent of all cases unmatched. There was then a slight rise in unmatched cases in the first half of the nineteenth century, reaching approximately 29 per cent in the 1810s and the 1840s. This latter rise may have been the result of the growth of nonconformist burial grounds in Bedfordshire at that time. Overall, Tables 3 and 4 suggest that there were no major

Table 4 The matching of Bedfordshire probate and burial records by decade, 1600–1849

Period	No. unmatched	No. matched	Total	% unmatched
1600–09	95	380	475	20.0
1610–19	239	882	1,121	21.3
1620–29	161	722	883	18.2
1630–39	195	695	890	21.9
1640–49	87	275	362	24.0
1650–59	65	193	258	25.2
1660–69	275	628	903	30.5
1670–79	353	878	1,231	28.7
1680–89	345	1,121	1,466	23.5
1690–99	150	618	768	19.5
1700–09	256	893	1,149	22.3
1710–19	275	966	1,241	22.2
1720–29	357	1,137	1,494	23.9
1730–39	270	823	1,093	24.7
1740–49	255	798	1,053	24.2
1750–59	199	634	833	23.9
1760–69	206	650	856	24.1
1770–79	136	593	729	18.7
1780–89	151	565	716	21.1
1790–99	147	463	610	24.1
1800–09	163	452	615	26.5
1810–19	188	462	650	28.9
1820–29	182	513	695	26.2
1830–39	166	495	661	25.1
1840–49	195	487	682	28.6

Source: Stuart and P. Wells eds, Alan F. Cirket comp., *Index of Bedfordshire probate records, 1484–1858* (London, 1993–1994), British Record Society, 104 and 105; Bedfordshire Family History Society Burial Database.

variations over time in the adequacy of adult burial registration, a conclusion confirming earlier work on this subject.[39]

Sample sizes for individual parishes are not sufficiently large for a breakdown over time, except for the two towns of Bedford and Luton, data for which are presented in Table 5. In Bedford, the proportion of unmatched cases rose between 1600 and 1749, before falling thereafter, whereas in Luton the percentage of unmatched cases increased steadily and sharply between 1600 and 1849. There was a relatively low number of unmatched cases in Luton in the seventeenth and early eighteenth centuries, and this may have been the result of procedures adopted in the town for parish registration, which for one period involved the making of rough copies of the registers (used in the transcription of the parish register) which were signed and sealed as correct by local magistrates.[40]

It should be noted that many of the parishes on the county boundary (especially in the north west) where we would have expected seepage were among the parishes with the

39 See Razzell, 'An evaluation of the reliability'.

40 According to the introduction to the published Luton parish register, a 'rough copy register appears to have been written by the parish clerk at the time of the ceremony. There are two of these, the first covering the years 1719–1730 and the second 1731–1773. For a time the second one was shown annually to local Justices of the Peace and is signed and sealed by them as a correct record.' 'Introduction', Luton Parish Register (Society of Genealogists Library, Ref BE43R).

Table 5 The matching of probate and burial records in Bedford and Luton, 1543–1849

Period	No. unmatched	No. matched	Total	% unmatched
Bedford				
1600–49	10	24	34	29.4
1650–99	54	108	162	33.3
1700–49	202	334	536	37.7
1750–99	90	201	291	30.9
1800–49	117	255	372	31.5
Luton				
1600–49	15	107	122	12.3
1650–99	49	182	231	21.2
1700–49	57	210	267	21.3
1750–99	40	86	126	31.7
1800–49	71	87	158	44.9

Source: Stuart and P. Wells eds, Alan F. Cirket comp., *Index of Bedfordshire probate records, 1484–1858* (London, 1993–1994), British Record Society, 104 and 105; Bedfordshire Family History Society Burial Database.

lowest proportions of unmatched records. There is a slight association between the population size of a parish and the proportion of unmatched cases. Parishes with low populations tend to have small proportions of unmatched cases (although sample sizes are very small) and the parishes with large populations have greater percentages of unmatched cases. However, there is no statistically significant association between population size and proportions of matched cases, and the hypothesis put forward in previous research that population size influenced registration adequacy is not confirmed in this study.[41]

Since the data were available we felt it was worthwhile reporting these rates for occupation. Table 6 summarises matching data by occupation—taken from the probate index—for those occupational groups with at least 100 probate cases.

It is interesting to note that labourers and husbandmen have low proportions of unmatched cases, whereas gentlemen, esquires and knights have higher proportions, which is not what might be expected from the status of these occupations and likely burial registration coverage. Analysis of the relationship between reported occupation and chance of being matched suggests that this relationship is statistically significant and not due to chance. Unmarried individuals (widows, spinsters and bachelors) have relatively high numbers of unmatched cases which may have been the result of the unavailability of relatives to ensure accurate registration of burials. None of the seven dissenting ministers in the probate sample had burials registered in the Anglican Church, which is perhaps as expected in view of their religious affiliation.

The growth of nonconformist registration of births and deaths was seen by Krause and by Wrigley and Schofield as a noteworthy influence on the effectiveness of Anglican

41 P.E. Razzell, 'Life and death in Bedfordshire: early research findings', *Bedfordshire Family History Society Journal*, 15 (2005).

Table 6 The matching of Bedfordshire probate and burial data by occupational group, 1543–1849

Occupational group	No. unmatched	No. matched	Total	% unmatched
Victuallers	42	273	315	13.3
Gardeners	24	137	161	14.9
Carpenters and joiners	87	434	521	16.7
Blacksmiths and smiths	61	288	349	17.5
Innholders, innkeepers and publIcans	56	240	296	18.9
Husbandmen	248	1,050	1,298	19.1
Clerks/clergymen	40	169	209	19.1
Bakers	36	142	178	20.2
Labourers	275	1,077	1,352	20.3
Weavers	45	175	220	20.5
Bricklayers	26	100	126	20.6
Dairymen	53	203	256	20.7
Farmers	212	794	1,006	21.1
Tailors	68	254	322	21.1
Yeomen	882	3,280	4,162	21.2
Shepherds	36	131	167	21.6
Butchers	56	200	256	21.9
Cordwainers and shoemakers	66	207	273	24.2
Millers	39	122	161	24.2
Maltsters	37	106	143	25.9
Gentlemen, esquires and knights	201	571	772	26.0
Bachelors and singlemen	35	94	129	27.1
Wheelwrights	44	104	148	29.7
Grocers	57	128	185	30.8
Widows	957	2,137	3,094	30.9
Spinsters, singlewomen and maids	179	365	544	32.9
Other occupations	411	1,277	1,688	24.3
No occupation	997	2,716	3,713	26.9
Total	5,270	16,774	22,044	23.9

Source: Stuart and P. Wells, eds, Alan F. Cirket comp., *Index of Bedfordshire probate records, 1484–1858* (London, 1993–1994), British Record Society, 104 and 105; Bedfordshire Family History Society Burial Database.

registration.[42] We can explore this topic, as the BFHS burial database includes returns of the number of nonconformist burials in Bedfordshire, data for which is summarised in Table 7.

The total number of nonconformist burials recorded in the BFHS database is relatively small: 2,595 (0.8 per cent of all entries in the database). Nonconformist burials were concentrated in towns, particularly Bedford and Luton (accounting for 1,690 burials, 65.1 per cent of dissenters). However, these 1,690 nonconformist burials formed a very small proportion (4.4 per cent) of the 38,640 Anglican burials in the two towns during the

42 J.T. Krause, 'The changing adequacy of English registration', in D.V. Glass and D.E.C. Eversley eds, *Population in history* (London, 1965), 379-93; Wrigley and Schofield, *Population history of England*, 89-96.

Table 7 Number of nonconformist Bedfordshire burials by religious congregation

Congregation	No. of burials	Period covered
Ampthill Methodist	27	1817–1841
Ampthill Quaker	121	1707–1847
Bedford Bunyan Meeting Baptist	93	1846–1850
Bedford Congregational	61	1785–1836
Bedford Howard Church	147	1790–1837
Bedford Moravian	508	1746–1850
Bedford Primitive Episcopalian	62	1834–1845
Bedford Protestant Dissenters	87	1837–1850
Biggleswade Baptist	3	1786, 1829
Biggleswade Methodist	26	1835–1850
Biggleswade Protestant Dissenters	2	1727, 1786
Blunham Baptist	99	1739–1849
Cranfield Baptist	97	1794–1837
Hockliffe Congregational	1	1817
Houghton Regis Baptist	17	1806–1837
Leighton Buzzard Baptist	41	1771–1841
Leighton Buzzard Quaker	44	1826–1850
Little Staughton Baptist	22	1786–1806
Luton Baptist	617	1785–1850
Luton Quaker	115	1776–1850
Maulden Independent	32	1785–1834
Ridgmont Baptist	133	1705–1850
Southill Baptist	9	1802–1820
Stevington Baptist	78	1705–1850
Turvey Congegational	6	1848–1850
Woburn Congegational	81	1790–1837
Woburn Sands Quaker	66	1704–1849
Total	2,595	

Source: Bedfordshire Family History Society Burial Database.

parish register period, although they were concentrated in the second half of the eighteenth and first half of the nineteenth century, as evidenced by Table 8.

Table 8 shows that there were no important changes in the proportion of reported nonconformist burials, but that there was considerable long-term growth in these burials between the middle of the eighteenth and nineteenth centuries. By the 1840s, between approximately a fifth and a quarter of all burials took place in Bedford and Luton nonconformist burial grounds, partly accounting for the deterioration in the quality of Anglican burial registration in this period (see Table 5).

What are the overall conclusions to emerge from the comparison of probate with burial register data? Although there is some variation over time, and between different parishes and occupational/status groups, the differences are not sufficiently clear to establish precise relationships. There are few other data to compare with the probate/burial material, but one other source of information is that derived from same-name analysis for

Table 8 Proportion of nonconformist burials in Bedford and Luton, 1740–1849

Period	Bedford			Luton		
	Nonconformist burials	Total burials	% of nonconformist burials	Nonconformist burials	Total burials	% of nonconformist burials
1740–49	11	422	2.6	–	–	–
1750–59	49	420	11.7	–	–	–
1760–69	63	444	14.2	–	–	–
1770–79	41	388	10.6	5	661	0.8
1780–89	81	497	16.3	60	847	7.1
1790–99	75	432	17.4	71	780	9.1
1800–09	99	527	18.8	24	639	3.8
1810–19	79	541	14.6	63	658	9.6
1820–29	83	655	12.7	44	745	5.9
1830–39	134	801	16.7	131	1,094	12.0
1840–49	225	863	26.1	293	1,558	18.8

Source: Bedfordshire Family History Society Burial Database.

Table 9 Unmatched Bedfordshire probate cases compared to untraced same-name cases in nine reconstitution parishes.

Period	% of unmatched Bedfordshire probate cases	Period	% of same-name children not traced in burial registers: nine reconstitution parishes
1543–99	26.0	1538–99	34.1
1600–49	20.8	1600–49	31.0
1650–99	25.8	1650–99	27.1
1700–49	24.0	1700–49	22.3
1750–99	23.1	1750–99	27.0
1800–49	28.9	1800–37	23.1

Source: For the probate/burial data see Table 7; for the same-name material see Razzell, *Population and disease*,15.

nine reconstitution parishes. The two sources are not directly comparable, as they employ different methodologies and are not for the same geographical areas, as well as involving different populations—adults with some wealth on the one hand and children from the general population on the other. Generally, we would expect people leaving wills to have burials registered more efficiently than those not leaving wills. Nevertheless, given the paucity of empirical research on registration reliability, it is of interest to compare the results of the two studies (see Table 9).

Table 9 shows similar temporal fluctuations, and the proportions of untraced burials vary within the fairly narrow band of one fifth to one third of the total number of cases, a range of variation not dissimilar to that found in previous research from the comparison of census and baptism records.[43]

43 See Razzell, *Essays in English population history*, 95.

Table 10 Husbands and wives listed in the 1782 Cardington census and traced in Bedfordshire baptismal registers

Period of estimated birth	Born in Cardington			Born elsewhere in Bedfordshire			Total born in Cardington and elsewhere in Bedfordshire		
	Total cases	No. untraced	% untraced	Total cases	No. untraced	% untraced	Total cases	No. untraced	% untraced
1710–32	21	4	19.0	40	13	32.5	61	17	27.9
1733–42	21	6	28.6	37	11	29.7	58	17	29.3
1743–52	9	3	33.3	42	6	14.3	51	9	17.6
1753–62	12	1	8.3	24	8	33.3	36	9	25.0
Total	63	14	22.2	143	38	27.0	206	52	25.2

Source: David Baker ed., *The inhabitants of Cardington in 1782* (Bedfordshire Historical Record Society, 52, 1973); Bedfordshire Family History Society Burial Database.

Table 11 Comparison of census/baptism register data for males listed as born in Cardington in the 1851 census

Period of estimated birth	Total no. of cases	No. untraced	% untraced
1770–1809	56	17	30.4
1810–29	54	17	31.5
1830–39	66	29	43.9
1840–49	67	32	47.8

Source: 1851 Census for Cardington; Cardington baptism register in the Bedfordshire Record Office.

Although the prime focus of this paper is on the evaluation of burial registration reliability, it is possible to carry out a similar comparison for Bedfordshire births/ baptisms in the eighteenth century by using information from the published 1782 listing of Cardington.[44] The original listing gives the ages and birthplaces of household heads and their spouses (giving details of maiden names for married women) and David Baker, the editor of the published version, and his fellow researchers attempted to trace the baptisms of everyone with this information by searching both the published and manuscript versions of all the relevant baptism registers for the whole of Bedfordshire. Their researches are summarised in Table 10.

The overall figure of untraced Bedfordshire baptisms in the period 1710–62, at 25.2 per cent, is very similar to the proportion of untraced probate/burial cases in approximately the same period (1700–49), which stood at 23.4 per cent.[45] As with untraced probate cases, there is no clear trend of change over time, a conclusion partially confirmed by a comparison of census/baptism register data for native males listed in the 1851 Cardington census.

44 David Baker ed., *The inhabitants of Cardington in 1782* (Bedfordshire Historical Record Society, 52, 1973).

45 No attempt was made by Baker and colleagues to trace baptisms in parishes other than the parish of stated birth, and this and other problems mean that the census/baptism figures are not strictly comparable to the probate/burial ones.

The figures in Tables 10 and 11 are not strictly comparable as the former refer to men and women born in all parts of Bedfordshire, whereas the latter are just for males—mainly children—born in Cardington. Nevertheless, the tables suggest that baptism under-registration did not vary greatly in the eighteenth and early nineteenth centuries, fluctuating between about 20 to 30 per cent, before deteriorating in the 1830s and 1840s, possibly as a result of the growth of religious nonconformity in Cardington.[46]

The above findings on burial and baptism under-registration suggest that they did not vary either over time or by parish or occupational status, indicating that they were essentially random, probably largely due to clerical negligence in the registration of both burials and baptisms.[47]

Comparison of Anglican burials with civil registered deaths

In order to further evaluate the quality of Anglican parish registration, a comparison was made of the number of burials and civil registered deaths in individual registration districts. The parishes included in the comparison were those listed by the Registrar General for a particular district, although it is not entirely clear whether the boundaries of the parishes coincided exactly with those of the registration district. Table 12 compares burials with deaths in a number of registration sub-districts (RSDs), and aggregated RSDs where overlap is known.

There is considerable variation in the ratios of burials to deaths in different RSDs. Some had very high burial/death ratios—for example, Barford 99.7 per cent, Cranfield 92.9 per cent and Woburn 93.6 per cent—suggesting that by the 1840s Anglican burial registration was capturing the majority of deaths in these rural areas. Generally, however, the more urban RSDs, especially Luton and Bedford, have substantially lower burial/death ratios than elsewhere, reflecting the findings on the analysis of the probate records and parish register events, with higher proportions of untraced burials in these two urban areas. However, these were also the districts with the largest number of non-Anglican burials in the 1840s (see Table 13), partly accounting for their low burial/death ratios.

The overall ratio of burials to deaths for all registration districts covered by Table 13 (77.2 per cent) suggests that 22.8 per cent of deaths were unregistered by Anglican burial registers, somewhat lower than the 28.6 per cent found from the comparison of probate records and burial registers in the 1840s. However, it would be misleading to conclude that burial/death ratios are measures of Anglican under-registration. There is clear evidence that civil registration was defective in the period leading up to 1874, when the law was revised on procedures of registration, making it mandatory on parents and others to register both births and deaths.[48]

46 No such deterioration was found by Razzell in an analysis of 45 parishes from various parts of England. See Razzell, *Essays*, 95.

47 Razzell, *Essays*, 35–8.

48 *35th Annual report of the Registrar General* (1874), xxxi–xxxiii.

Table 12 Comparison of the number of Bedfordshire Anglican burials with civil register returns of deaths by registration sub-district, 1841–1850

Registration sub-district(s)	Anglican burials	Civil register deaths	Burials divided by deaths (%)
Luton	1,865	2,997	62.2
Harrold	531	679	78.2
Toddington	860	989	87.0
Riseley	402	620	64.8
Bedford and Cardington and Bedford and Kempston	3,403	4,897	71.1
Cranfield	733	789	92.9
Biggleswade	2,330	2,830	82.3
Sharnbrook	487	560	87.0
Woburn	1,303	1,392	93.6
Ampthill and Shillington	2,250	2,744	82.0
Turvey	446	503	88.7
Barford	599	601	99.7
Total	15,209	19,601	77.2

Source: Bedfordshire Family History Society Burial Database; *13th Annual Report of the Registrar-General* (London, 1854), 246–49.

Note: To accommodate the practice of 'splitting' parishes across Registration Sub-Districts some have been combined in this table. The registration sub-districts of Dunstable, Edlesborough, Ivinghoe, Leighton Buzzard, Potton and Wing are not included because they included parishes in adjoining counties.

Although the Registrar General attempted to make an estimate of the scale of under-registration, this was largely based on guesswork. It is however possible to make more precise estimates of civil under-registration by comparing Anglican and civil register data. In the Bedfordshire research, cases with a single surname entry were selected for the period 1838–1849 from parish burial registers in registration districts with the same name as the parish in question. A total of 129 cases were chosen for the parishes of Ampthill, Bedford, Biggleswade, Leighton Buzzard, Luton and Woburn. Of these 129 cases, 12 (9.3 per cent) could not be traced in the civil register death index, suggesting a degree of death under-registration.

Comparing the 1841 and 1851 censuses and burial records for 13 Bedfordshire parishes

Previous research on Bedfordshire adult mortality involved tracing married couples enumerated in the 1841 census in the subsequent 1851 census, and linking these data with information in the BFHS burial database.[49] Thirteen parishes were selected for this analysis: Barton in the Clay, Bedford, Chalgrave, Dunstable, Henlow, Houghton Regis, Husborn Crawley, Maulden, Milton Bryant, Sandy, Shitlington, Toddington and Woburn.[50]

When one of the married couple was enumerated as a widow or widower in the 1851 census, a search was then made in the burial register for the burial of the partner of the

49 Razzell, 'Life and death in Bedfordshire'.

50 With respect to Bedford, it was originally intended to work just with Bedford St Mary, but the nature of the indexing made it necessary to select a sample from the whole town of Bedford. The first 498 married individuals were selected from all parishes in the town, the equivalent number of married couples in the parish of Bedford St Mary.

Table 13 **Number of burials of individuals enumerated in the 1841 census whose partners were listed as widows and widowers in the 1851 census, by occupational group, 13 Bedfordshire parishes**

Occupational group	No. burials traced	No. burials untraced	Total	% untraced
Labourers and servants	115	40	155	25.8
Tradesmen and artisans	75	40	115	34.8
Farmers	15	5	20	25.0
Total	205	85	290	29.3

Source: 1841 and 1851 censuses for Barton in the Clay, Bedford, Chalgrave, Dunstable, Henlow, Houghton Regis, Husborne Crawley, Maulden, Milton Bryant, Sandy, Shillington, Toddington, Woburn.

Table 14 **Number of burials of individuals enumerated in the 1841 census whose partners were listed as widows and widowers in the 1851 census by parish**

Parish	Traced	Untraced	Total	% traced
Barton in the Clay	17	10	27	63.0
Bedford	13	8	21	61.9
Chalgrave	14	0	14	100.0
Dunstable	24	13	37	64.9
Henlow	10	2	12	83.3
Houghton Regis	20	1	21	95.2
Husborne Crawley	3	5	8	37.5
Maulden	16	5	21	76.2
Milton Bryant	7	0	7	100.0
Sandy	19	7	26	73.1
Shillington	21	8	29	72.4
Toddington	31	17	48	64.6
Woburn	10	9	19	52.6
Total	205	85	290	70.7

Source: See Table 13.

widow or widower. Information on deaths was thus derived from two sources: the marital status of surviving partners (widows or widowers) and entries in local burial registers. This in effect corrects for burial under-registration, as the majority of deaths were established independently through the tracking of married individuals becoming widows and widowers. This independent evidence allows for the calculation of burial under-registration by occupational group.

The proportion of untraced burials was higher amongst tradesmen and artisans than labourers, and this may be partly the result of more of the former living in large towns where registration was more defective. There was some variation in the proportion of burials traced in different parishes, although the samples are too small to come to firm conclusions.

There were some small rural parishes—such as Chalgrave, Houghton Regis and Milton Bryant—where burial registration was nearly perfect, but there were others—Barton in the Clay, Husborne Crawley, Toddington and Woburn—where it does not appear to have been so reliable. Although the sample sizes are very different, the overall percentage

of untraced burials, at 29.3 per cent, is very similar to that found in the comparison of probate with burial registration data in the 1840s, at 28.6 per cent.

Conclusions

A number of conclusions arise from this study. First, the BFHS transcripts of burials for 1538–1851 and baptisms for 1813–51 are of a very high quality, with virtually no entries in the original registers missing from the digital transcript and few or no misspellings of names or other register items. Second, there are major differences between the number of entries in the BFHS database and Rickman's published returns of burials for four Bedfordshire hundreds in the eighteenth century, particularly for burials in the first half of that century. If repeated in other areas, this could affect conclusions about Britain's population history based on Rickman's data. Third, the Cambridge Group's returns of burials for 20 Bedfordshire parishes matches well with BFHS data, although it is slightly less reliable than the latter source. Fourth, the comparison of probate with burial register data indicates that there was little long-term change over time in burial under-registration, with between 21 and 27 per cent of burials missing in the registers. There was also little variation between parishes of different population sizes, suggesting that burial under-registration was predominantly a random process linked to clerical negligence. However, there was a statistically significant association between occupational grouping and burial registration reliability which poses additional questions relating to the influence of occupations. Fifth, the comparison of civil registration returns and BFHS burials for 14 registration sub-districts indicates that there were 22.8 per cent fewer BFHS Anglican burials than civil registration births and deaths in the 1840s. Sixth, the comparison of 1841 and 1851 census data, linked to the BFHS burial database for the 1840s, yielded a number of findings: in particular, the proportion of missing burials amongst married couples was 29.3 per cent, similar to that found in the probate/burial register comparison in the 1840s.

These conclusions raise major questions about the nature of England's population history. Wrigley and Schofield in their *Population history of England* assumed that, except for periods when registration broke down completely, burial registration was complete between 1539 and 1640 and only deteriorated very sharply at the beginning of the nineteenth century.[51] Likewise, with birth registration, they assumed that it was perfect in the 1540s and only worsened at the end of the eighteenth century.[52] Contrary to these assumptions, the present research has found that between 20 and 30 per cent of burials went unregistered in Bedfordshire for the whole period between 1543 and 1850. Earlier research by Razzell, which compared the 1851 census with baptism registers for 45 parishes from various areas of England, indicated that between one quarter and one third of all births were not registered by the Anglican Church in the period 1760–1834.[53] In the

51 Wrigley and Schofield, *Population history of England*, 545-52.

52 *Ibid*., 537-44.

53 Razzell, *Essays*, 82-149.

Table 15 The matching of probate and burial records in 28 Cambridge Group aggregative parishes by half-century, 1543–1849

Period of probate	No. unmatched	No. matched	Total	% unmatched
1543–99	73	151	224	32.59
1600–49	243	928	1,171	20.75
1650–99	400	1,099	1,499	26.68
1700–49	410	1,409	1,819	22.53
1750–99	237	912	1,149	20.62
1800–49	219	743	962	22.76
Total	1,582	5,242	6,824	23.18

Source: Stuart and P. Wells eds, Alan F. Cirket comp., *Index of Bedfordshire probate records, 1484–1858* (London, 1993–1994), British Record Society, vols. 104 and 105; Bedfordshire Family History Society Burial Database.

current research, we have found similar levels of birth under-registration in Bedfordshire from the 1710s onwards, suggesting that the adequacy of birth registration did not change in any noteworthy fashion during the eighteenth and early nineteenth centuries.

Twenty-eight Bedfordshire parishes were included in the Cambridge Group's aggregative sample,[54] and analysis of probate and burial records in these parishes reveals the pattern shown in Table 15. The overall proportion of unmatched cases in the 28 parishes, at 23.2 per cent, is slightly lower than that found for in all Bedfordshire parishes in the period 1543–1849, which stood at 23.9 per cent. The highest proportions of unmatched cases in the 28 parishes were in the sixteenth and second half of the seventeenth century, but this was probably largely due to the sample size in the former and the disruptive effect of the Civil War in the latter. Overall, this evidence suggests that there were minimal changes in burial registration reliability in the Cambridge Group's 28 Bedfordshire parishes in the period 1543–1849, and this was particularly the case in the eighteenth and early nineteenth centuries.

The Cambridge Group's aggregative data for England indicates a fall in the crude burial rate from 27.7 per 1,000 in 1701–40 to 20.6 in 1780–1820,[55] and if we inflate these rates by 25 per cent—the minimum estimated omission rate—the adjusted figures suggest a fall in the death rate from 36.9 per 1,000 in 1701–40 to 27.5 per 1,000 in 1780–1820. The overall death rate in England during the 1840s when civil registration data becomes available was 22.5 per 1,000, indicating a continuing fall in mortality during the late eighteenth and early nineteenth century.[56]

54 The parishes are Ampthill, Blunham, Bolnhurst, Campton, Chalgrave, Clophill, Cranfield, Felmersham, Flitwick, Harlington, Kempston, Maulden, Millbrook, Milton Ernest, Northill, Pavenham, Pulloxhill, Riseley, Sandy, Souldrop, Southill, Stevington, Studham, Thurleigh, Tingrith, Toddington, Woburn, Wootton.

55 Razzell, *Population and disease*, 47.

56 B.R. Mitchell and P. Deane, *Abstract of British historical statistics* (Cambridge, 1962), 36.

The evidence suggests that there were little or no important change in the adequacy of baptism registration in Bedfordshire in the eighteenth and early nineteenth centuries, confirming research on a number of other parishes for different parts of England.[57] According to the Cambridge Group's aggregative data, the crude baptism rate in England was constant between 1701 and 1820, and it was only because the number of baptisms were inflated at the end of the eighteenth century that it was concluded that there was an overall rise in fertility.[58]

None of these figures should be taken too literally, as there is uncertainty about the exact extent of baptism and burial under-registration in England as a whole during the parish register period. Also, changes in the age structure of the population and other demographic factors are important in assessing England's population history at this time. None of these problems can be entirely solved by mathematical models, as the latter are very sensitive to even slight changes of assumption.[59] In this situation, only careful local studies which include an assessment of parish register quality are likely to advance a reliable understanding of England's population history during the parish register period.

57 Razzell, *Essays*, 95.

58 Razzell, *Population and disease*, 47.

59 Razzell, *Essays*, 178.

Debates in population history

Living same-name siblings in England, 1439–1851

Peter Razzell

The paper by Chris Galley, Eilidh Garrett, Ros Davies and Alice Reid on the topic of living same-name siblings, published in the last edition *of Local Population Studies*, is a welcome contribution to the debate about living same-name children in Britain. They note that there has been little scholarly research on the topic, which they seek to redress by their study of same-name practices in Scotland. They successfully establish the existence of living same-name children in northern Scotland until the end of the nineteenth century, which they link to traditional Scottish naming customs and practices.

They also cite examples of living same-name children in England, although they caution against reliance on purely anecdotal evidence. They quote Edward Gibbon's autobiographical account of living same-name siblings in his family, but their research indicates that there were no living same-name siblings baptised and buried in his family. Likewise, they raise the possibility that many living same-name children may have been step-siblings, suggesting that the data must be treated with care. Research on this topic has been carried out by the prominent American genealogist Robert Anderson. George Redmonds has summarised Anderson's work as follows:

> Having studied more than a dozen examples [in New England], almost equally divided between boys and girls, his conclusion was that in every case where surviving children bore the same name it was because they were half siblings, that is to say they did not have the same mother. In most cases the names of the brothers were the same as the name of the father … However, that cannot always be the explanation, for there are other instances in which full siblings bore the same name, a point that Robert Anderson made himself when discussing New England families whose children had been named in Old England.[1]

Galley et al. also cite examples where there were living same-name children in England, although they raise the issue of regional variation and how the existence of living same-name

1 C. Galley et al., 'Living same-name siblings and British historical demography', *Local Population Studies*, 86 (2011), 15–36; G. Redmonds, *Christian names in local and family history* (London 2004), 49.

children may have changed over time. Their main evidence for Scotland is derived from late nineteenth-century censuses, but similar research on the 1851 English census covering 45 parishes from all areas of England indicates no living same-name children during the mid-nineteenth century.[2] There are few censuses before the nineteenth century, but the enumeration listings associated with the 1695 Marriage Duty Act do include details of individual family members. An examination of 14 listings reveals no living same-name children in the late seventeenth and early eighteenth century. These 14 places, with dates of enumeration, are as follows: London (1695), Bristol (1696), Lichfield, Staffordshire (1697), Lyme Regis, Dorsetshire (1696, 1698 and 1703), Swindon, Wiltshire (1697 and 1702), Wanborough, Wiltshire (1697 and 1702), New Romney, Kent (1696 and 1699), Melbourne, Derbyshire (1695) and St Mary's Southampton, Hampshire (1695 and 1696).[3]

The London data was edited by David Glass and covers 'almost 60,000 individuals', with 'the wife and children of a man ... listed next to his name'.[4] A search of the listing reveals no living same-name children and, as many of London inhabitants were migrants from all regions of England, this suggests that the practice no longer existed at the end of the seventeenth century.[5] Likewise, the published Marriage Duty enumeration of Bristol, which included approximately 20,000 inhabitants in 1696, does not include any reference to living same-name children.[6] There were three censuses conducted at an earlier data—Goodnestone, Kent (1676), and Clayworth, Nottinghamshire (1676 and 1688)—and again it was not possible to locate any living same-name children.[7]

No other earlier census has been examined for this research, but transcripts of wills do provide data which can be used for this purpose. The 1658 Prerogative Court of Canterbury will abstracts are for the Commonwealth period when the Court had national jurisdiction over all wills covering families from all areas of England.[8] An examination of the first 100 families with at least two siblings of the same sex indicates that there were just two living same-name siblings out of a total of 817 siblings, suggesting that such children did not exist to any extent in the mid seventeenth century. However, earlier will abstracts for other church courts do indicate that living same-name children existed in significant

2 The parishes covered by this research are listed in P. Razzell, *Essays in English population history* (London, 1994), 93.

3 For the London listing see D.V. Glass ed., *London inhabitants within the wall* (London, 1965); for Bristol see E. Ralph and M.E. Williams eds, *The inhabitants of Bristol in 1696* (Bristol Record Society, 15, 1968). Copies of the other listings are lodged in the Cambridge Group's library, and photocopies of these were kindly sent to me by their archivist.

4 Glass, *London inhabitants*, xviii, xx.

5 For example, see P. Razzell, *Population and disease: transforming English society, 1550–1850* (London, 2007), 101.

6 Ralph and Williams, *The inhabitants*.

7 Copies of these listings were also provided by the Cambridge Group's archivist.

8 For the source of this data see W. Brigg ed., *Genealogical abstracts of wills proved in the Prerogative Court of Canterbury* (London, 1905).

Table 1 Living siblings with the same names in will abstracts with at least two siblings of the same sex, 1439–1699[9]

District	Date of will	Number of living same-name siblings	Total number of siblings	Proportion of living same-name siblings (%)	Sample
Sudbury Archdeaconary Court	1439–1474	34	258	12.7	First 100 families
London Consistory Court	1492–1547	6	49	12.2	All families
Lincolnshire Wills	1500–1600	0	854	0.0	All families
Berkshire	1519–1598	12	213	5.6	First 100 families
Surrey Archdeaconary Court (outside London)	1537–1541, 1558–1560	31	718	4.3	First 185 families
Surrey Archdeaconary Court (London*)	1537–1541, 1558–1560	6	194	3.1	All families
Essaex Archdeaconary Court	1558–1565	10	315	2.5	First 100 families
Registry of Durham	1563–99	0	388	0.0	All families
Banbury, Oxfordshire	1591–1620	0	317	0.0	All families
Surrey Archdeaconary Court	1595–1649	0	177	0.0	All families
Essex Commissary Court	1596–1603	8	340	2.4	First 100 families
Berkshire	1600–1649	6	313	1.9	First 100 families
Surrey Archdeaconary Court (outside London)	1608–1615	2	344	0.6	First 100 families
Surrey Archdeaconary Court (London*)	1608–1615, 1615–1623 1620–1631	0	288	0.0	First 100 families
London Commisary Court	1629–1634	4	640	0.6	First 100 families
Sudbury Archdeaconary Court	1636–1638	2	410	0.5	First 100 families
London Commissary Court	1644–1646	0	149	0.0	All families
Berkshire	1650–1699	2	368	0.5	First 100 families
Canterbury Prerogative Court (national jurisdiction)	1658	2	817	0.2	First 100 families

Note: *Includes Southwark, Bermondsey, Lambeth, Wandsworth, Battersea and Rotherhithe.

numbers, particularly during the period before 1550. The following table summarises available data on will abstracts from a number of church courts.

Table 1 indicates that most living same-name children occurred in the late fifteenth and early sixteenth century. There were few or no living same-name children in the seventeenth century, and many of the few cases listed in the early part of the century

9 *Genuki Berkshire online*, abstracts of wills; I. Darlington ed., *London Consistory wills, 1492–1547*,London Record Society, 3 (1967); A.R. Maddison ed., *Lincolnshire wills 1500–1600* (Lincoln, 1888); J.S.W. Gibson ed., *Banbury wills and inventories 1591–*1620, Banbury Historical Society, 13 (1985); W. Greenwill ed., *Wills and inventories from the Registry of Durham, Part 2, 1563–*99, Surtees Society, 38, (1860); W. Brigg ed., *Genealogical abstracts of wills proved in the Prerogative Court of Canterbury: Register Wootton* (London, 1905); F.G. Emmison, *Essex Wills: Archdeaconary of Essex, 1558–65* (Washington D.C., 1982) ; F.G. Emmison, *Essex Wills: the Commissary Court, 1596–1603* (Chelmsford, 2000); P. Northeast, *Wills of Archdeaconary of Sudbury 1439–*74, Suffolk Record Society, 44 (2001); N. Evans ed., *Wills of Archdeaconary of Sudbury, 1636–*38, Suffolk Record Society, 29 (1993); C. Webb, *Archdeaconary Court of Surrey will abstracts, 1537–41, 1559–60, 1595–1649, 1608–15, 1615–23, 1620–31* (Transcripts in London Metropolitan Archives).

probably referred to older children born in the late sixteenth century. Living same-name children seem to have disappeared slightly earlier in London than elsewhere, and there were no such children in the London parishes included in the Surrey Archdeaconary Court and the London Commissary Court will abstracts after 1600.

Houlbrooke summarised patterns of same naming which is consistent with the above findings:

> The greater variety of opinion about the bestowal of names which prevailed after the Reformation gave parents more freedom to follow their own inclinations. One result was that the bestowal of the same name on more than one living child became much less frequent from the sixteenth century onwards. But in many cases parents continued to give babies the same name as older siblings who had died.[10]

The disappearance of living same-name children may have been partly the result of the introduction of parish registration, with parents having to formally name their children, and was possibly linked to the decline of children being named after god-parents.[11] However, of the 125 living same-name cases in Table 1, 110 were males and 74 were named John. It is unclear why males should predominate in this way, and even less clear why the name John was used so frequently. It is possible that the use of the name John in this way is linked to the legal practice of using the fictitious name John Doe in litigation procedures from the early fourteenth century onwards.[12] Jeremy Boulton has described how in the Southwark burial register the keeper of the burial register named all 27 unbaptised female children as Joan in the period 1597–1602, with 10 of the 29 unbaptised males named John.[13] However, none of this evidence explains why the name John predominated amongst living same-name children, and this intriguing issue can only be resolved through further research on naming patterns, requiring detailed genealogical and local historical investigation.

Galley et al. also raise the question of the use of same-name data for the correction of mortality rates. It is important that such corrections do not rely on any one inflation ratio, and there are a number of additional methods for measuring registration accuracy. These may be summarised as follows:

- The comparison of information in wills and poor law records with that in burial registers.
- The matching of census and parish register data.

10 RA. Houlbrooke, *The English family 1450–1750* (Harlow, 1984), 131–2.

11 Houlbrooke, *English family*, 131.

12 See the entry for John Doe in the *Oxford English Dictionary.*

13 *Local Population Studies*, 23 (1979), 51.

- The comparison of returns of burials in bills of mortality and burial registers.
- The tracing of independent information on burials with that in parish registers.[14]

The application of these methods indicates that for purposes of family reconstitution, on average between a quarter and a third of all deaths went unregistered in burial registers during the parish register period. The latter may be illustrated with respect to London. For the parish of Bloomsbury, a searcher's reports register for the period 1770–1834 lists the export of corpses to other parishes both in London and elsewhere, naming the parish 'where buried'.[15] This allows the direct measurement of the accuracy of the registration of these burials, and of 466 such cases in 1771–74 and 1801–07, 106 (22.7 per cent) could not be traced in local parish registers, although this varied significantly from parish to parish. This average is lower than the proportion of unregistered deaths according to the same-name correction technique (33 per cent) found in 16 London parishes for the period 1681–1709, and 35 per cent in eight London parishes in the period 1539–1849.[16] However, in addition to missing deaths due to the non-registration of burials, there is evidence that the 'traffic in corpses' possibly accounted for about 10 per cent of burials.[17] The combination of the non-registration of burials and the traffic in corpses would suggest that about a third of all burials were missing from reconstitution schedules in London, which is consistent with the findings from same-name research.

Although the above data is for different periods and parishes, it illustrates the possibilities for the triangulation of data necessary for the evaluation of burial registration. The paper by Galley et al. represents such work, along with the research summarised in this paper. With the digitisation of data, the issues of living same-name children and same-name correction ratios lend themselves to further detailed research, which should significantly clarify the accuracy of parish registers, a central issue in British historical demography.

14 For research on these methods see Razzell, *Population and disease*, 3–39, and P. Razzell, 'Infant mortality in London, 1538–1850: a methodological study', in this issue of *LPS*, above, 00–00

15 See the 'Searchers reports register' in the London Metropolitan Archive, reference P82/GE01/063.

16 Razzell, *Population and disease*, 13.

17 See J. Boulton and L. Schwarz, 'Yet another inquiry into the trustworthiness of the eighteenth-century London's bills of mortality', *Local Population studies*, 5 (2010), 28–45; Razzell, 'Infant mortality'.

Infant mortality in London, 1538–1850: a methodological study

Peter Razzell

Abstract

A review of evidence on infant mortality derived from the London bills of mortality and parish registers indicates that there were major registration problems throughout the whole of the parish register period. One way of addressing these problems is to carry out reconstitution studies of individual London parishes, but there are a number of problems with reconstitution methodology, including the traffic in corpses between parishes both inside and outside of London and the negligence of clergymen in registering both baptisms and burials. In this paper the triangulation of sources has been employed to measure the adequacy of burial registration, including the comparison of data from bills of mortality, parish registers and probate returns, as well as the use of the same-name technique. This research indicates that between 20 and 40 per cent of burials went unregistered in London during the parish register period.

Introduction

In a recent edition of *Local Population Studies*, Jeremy Boulton and Leonard Schwarz have carried out a detailed analysis of the reliability of the London's bills of mortality.[1] They have demonstrated that there was a significant amount of 'traffic in corpses' between London parishes, and some movement of corpses to parishes outside London. They conclude that the bills 'remain tolerably accurate in the aggregate',[2] a conclusion similar to that of a number of other scholars who have recently worked with the bills.[3] However, there is uncertainty about this conclusion, given the number of reasons for the unreliability of the bills, which may be listed as follows:

- The existence of Dissenters and Roman Catholics who both baptised independently and in some instances established their own burial grounds.
- The exclusion of a number of Anglican burial grounds within London from the defined area of the bills of mortality.

1 J. Boulton and L. Schwarz, 'Yet another inquiry into the trustworthiness of the eighteenth-century London's bills of mortality', *Local Population Studies*, 85 (2010), 28–45.

2 Boulton and Schwarz, 'Yet another inquiry', 28.

3 L. Schwarz, *London in the age of industrialisation* (Cambridge, 1992); J. Landers, *Death and the metropolis: studies in the demographic history of London* (Cambridge, 1993); R. Woods, 'Mortality in eighteenth century London: a new look at the bills', *Local Population Studies*, 99 (2006), 12–23.

- The movement of corpses from London to parish burial grounds outside of London.
- The neglect of baptism on religious or economic grounds, which in turn sometimes led to the non-registration of burials.
- The negligence of clergymen and parish clerks in compiling accurate statistics of baptisms and burials, both in parish registration and the submission of figures to the Company of Parish Clerks.[4]

Ogle concluded in his review of the bills in 1892 that it was necessary to add between 39 and 44 per cent to the recorded burials in the eighteenth century to reach a reliable estimate of the number of deaths, a proportion which he believed should be significantly increased for the nineteenth century.[5] There is evidence from a number of sources to confirm Ogle's doubts about the reliability of the bills.

The bills of mortality and London burial registers

There is considerable confusion about the way the bills of mortality were compiled and the relationship between the bills and parish burial registers. In order to clarify this issue, it is necessary to understand how the bills were organised. Graunt described how

> When any one dies [in London], then, either by tolling, or ringing of a bell, or by bespeaking of a grave of the sexton, the same is known to the searchers, corresponding with the said *Sexton*. The *Searchers* hereupon (who are ancient matrons, sworn to their office) repair to the place where the dead Corps lies, and by view of the same, and by other enquiries, they examine by what *Disease* or Casualty the Corps died. Hereupon they make their report to the *Parish Clerk*, and he, every *Tuesday* night, carries in an Accompt of all the *Burials* and *Christenings* happening that week, to the *Clerk* of the *Hall*. On Wednesday the general Accompt is made up and printed, and on *Thursday* published …[6]

The returns made to the Company of Parish Clerks were based on the searchers reports, which appear to have included all deaths that occurred within individual parishes. Reginald Adams, the historian of the London Parish Clerks, described how the bills were compiled as follows:

4 T. Birch ed., *A collection of the yearly bills of mortality from 1657 to 1758 inclusive* (London, 1759), 4–6; W. Black, *Observations medical and political* (London, 1781), 269–71; G.M. Burrows, *Strictures on the uses and defects of parish registers and bills of mortality* (London, 1818), 44–5; J. Angus, 'Old and new bills of mortality: movement of the population: deaths and fatal disease during the last fourteen years, 1840–54', *Journal of the Royal Statistical Society* 17 (1854), 118–19; W. Ogle, 'An inquiry into the trustworthiness of the old bills of mortality', *Journal of the Statistical Society*, 55 (1892), 437–51.

5 Ogle, 'An inquiry', 451.

6 J. Graunt, *Natural and political observations upon the bills of mortality* (London, 1676), 7–8.

> The basis of the collection was the return made out by each parish clerk by Wednesday for each week … The return contained information the clerk received about the causes of deaths from 'searchers' … When told by a sexton of a death, they [the searchers] had to visit the family and find out the cause of death … These women were required to place their reports, from which the information was subsequently abstracted by the clerks, in a box on the staircase in the Company's Hall.[7]

Individual searchers' reports have survived and have been deposited in the Guildhall Library. Some are just notes on scraps of paper, others are on a brief printed form with the signature of a searcher authenticating the contents of the report.[8] Not all reported deaths were included however in the bills of mortality, and Black wrote in 1781 that

> The law ordains, that every person, of whatever sect, who dies in London or the suburbs, is to be inspected by the two parish searchers, and reported to the parish clerk, who then grants his certificate for the internment: this was originally intended to detect the plague and concealed murders … Notwithstanding this ceremony of inspection by the searchers, and of making their reports to the parish clerk, it does not hence follow, that the clerk makes the return of death to the general hall, *unless the corpse is buried in his own ground, or parochial church-yard.* If the corpse is carried to any dissenting ground, and to various other places of sepulture not within the bills, the death and disease is so much waste paper, and is never heard of amongst the burials. Again, if the corpse is carried to a different parish, together with a certificate, then if such burying ground is within the bills, the death and disease is returned to the hall by the clerk of that parish, where the corpse in interred.[9]

Officially, no outside burial of a person dying within the bills of mortality should have taken place within an Anglican burial ground without a certificate issued by a parish clerk,[10] but this was not always the case. For example, in the parish of St Anne, Soho, there were many imported burials which were not returned to the Company of Parish Clerks,[11] presumably either lacking or ignoring the certificates that accompanied them. Boulton and Schwarz have concluded 'that Soho's "clandestine" [unregistered] burials occasionally accounted for one in twenty of all dead Londoners reported in the bills.'[12]

The ambiguity in the bills of mortality registration process led to confusion and contradictory returns of the number of burials. Ogle in his 1892 study of the bills concluded that

7 R.H. Adams, *The parish clerks of London* (London, 1971), 54.

8 'Searchers' and parish clerks' certificates', Reference *MS02185*, Guildhall Manuscript Library.

9 W. Black, *Observations*, 269, 270.

10 Boulton and Schwarz, 'Yet another inquiry', 36.

11 Boulton and Schwarz, 'Yet another inquiry', 40, 41.

12 Boulton and Schwarz, 'Yet another inquiry', 43.

> … the number of burials as given in the register is frequently in excess of the number given in the annual bill, and still more frequently falls short of it … very often the searcher must have been trusted to return … the number of burials; and that such return sometimes, included deaths of persons who were afterwards not buried in the parish graveyard, and more frequently omitted persons who were so buried, but concerning which the searcher received no information … Out of one hundred and twenty comparisons made by me between the annual return in the bills and the entries in a parish register, there were only twenty occasions, that is once in six times, in which the bill and register gave the same number. In the remaining hundred instances there was a discrepancy, and sometimes a very large one …[13]

This suggests that the bills of mortality and burial registers were at least partly independent of each other. This is confirmed by returns of burials for individual parishes in the bills even after they ceased to function as separate parishes. For example, the burial ground of Allhallows Honey Lane was closed in 1666 as a result of the destruction of the church by fire in that year, and it was united with St Mary le Bow in 1670 and absorbed into the burial register of that parish.[14] Nevertheless, some returns of burials were made for Allhallows in the bills of mortality for 1670 and between 1699 and 1719,[15] even though no people were being buried in the parish at those dates. Presumably the returns in the bills were of people dying in the parish, but buried elsewhere, suggesting that the searchers concentrated on deaths rather than burials.

Part of the confusion over burial registration is terminological. The London parish clerks were not responsible for the compilation of parish registers, which was officially the duty of the clergy of the parish.[16] However, in some instances parish clerks did compile the parish register—although they appear to have received an extra fee for this work[17]—and clergymen sometimes made returns of 'searched' burials to the Company of Parish Clerks, even though they were not subject to the authority of that body.[18] The dual process of registration may explain why in one parish the number of deaths reported in the bills of mortality for the year 1764 was 348, whereas the number of burials in the parish register for the same year was 1,442.[19]

13 W. Ogle, 'An inquiry', 441, 443.

14 *The Register of St. Mary le Bow Cheapside, All Hallows Lane and of St. Pancras, Soper Lane* Harleian Society, 44 (1914), 281.

15 Birch, *A collection*.

16 Adams, *Parish clerks*, 51; Boulton and Schwarz, 'Yet another inquiry', 43, 44.

17 Boulton and Schwarz, 'Yet another inquiry', 51.

18 Boulton and Schwarz, 'Yet another inquiry', 43–4.

19 Boulton and Schwarz, 'Yet another inquiry', 43–4.

Table 1 **Number of burials in six London parishes from 13 December 1743 to 11 December 1753**[20]

Parish	Register	Bills	Proportion of register to bills (%)
St Peter's, Cornhill	158	168	94.0
St Michael's, Cornhill	172	161	106.8
St Thomas Apostle	114	99	115.2
St Sionis, Backchurch	310	268	115.7
St Mary, Aldermary	164	194	84.5
St John Baptist, Wallbrook	179	202	88.6

Table 2 **Number of burials listed in parish registers and the bills of mortality of Clerkenwell and All Hallows Honey Lane, St Pancras Soper Lane & St Mary Le Bow (Cheapside parishes), 1657–1753**[21]

Period	St James Clerkenwell			Cheapside Parishes		
	Number of burials in bills	Number of burials in register	Proportion of bills/register burials (%)	Number of burials in bills	Number of burials in register	Proportion of bills/register burials (%)
1657–59	1,046	1,033	101.3	126	83	151.8
1660–69*	4,878	3,906	124.9	336	250	134.4
1670–79	3,671	3,109	118.1	307	294	104.4
1680–89	3,857	3,596	107.3	368	364	101.1
1690–99	3,722	3,653	101.9	320	316	101.3
1700–09	3,598	2,177	165.3	348	365	95.3
1710–19	4,550	4,411	103.2	353	347	101.7
1720–29	5,305	5,894	90.0	–	–	–
1730–39	5,248	5,673	92.5	–	–	–
1740–49	5,512	6,020	91.6	–	–	–
1750–53	1,916	2,080	92.1	–	–	–

Note: *The period covered for the Cheapside parishes is 1660–66 & 1669.

The partial independence of the bills of mortality and parish registers allows an assessment of the quality of both sources. Ogle published a number of figures for individual parishes, and the largest samples were for six parishes for the decade 1743–1753.

There was considerable variation between the different parishes, suggesting that registration problems varied significantly at this time. It is instructive to carry out a similar

20 Ogle, 'An inquiry', 445.

21 The number of burials in the bills of mortality are taken from Birch, *A collection*. The number of parish register burials are derived from the 'People in Place' dataset deposited in the UK Data Archive (Study Number UKDA-5791).

exercise for a much more extended period of time, and the 'People in Place' project has created an archive of demographic material for a number of London parishes which allows such an analysis. Table 2 above summarises data on St James Clerkenwell—the main parish in the dataset—and the three linked city parishes—All Hallows Honey Lane, St Pancras Soper Lane and St Mary le Bow in the Cheapside Ward.

There were major differences in the bills/register ratios over time in both Clerkenwell and the Cheapside parishes. For example, the bills/register ratio in Clerkenwell for the decade 1700–09 was nearly double of that in 1720–29, suggesting that parish registration improved significantly in the period. Table 2 indicates that there were major registration problems in some London parishes in the seventeenth and eighteenth centuries, a conclusion which will be further evaluated later in this paper.

Reconstitution methodology

Given the problems with the bills of mortality, a number of scholars have turned to reconstitution techniques to construct more reliable demographic statistics in the parish register period. However, reconstitution research itself is subject to significant difficulties, which may be summarized and discussed under the following headings:

- The burial of corpses in neighbouring parishes and elsewhere.
- Population mobility into and out of London parishes.
- The deaths of young infants before the date of baptism.
- The under-registration of births and deaths in parish registers.

The burial of corpses in neighbouring parishes and elsewhere

The practice of the moving corpses into other parishes appears to have varied significantly by place. Relatively low proportions of the 'traffic in corpses' appear to have occurred in some London parishes. Only 1.3 per cent of individuals dying in St Helen's Bishopsgate were carried out for burial in other parishes in the period 1640–58,[22] and 3.2 per cent of 188 burials in Aldersgate in 1696–7 were imported from outside.[23] Boulton and Schwarz have discovered a much greater proportion of the movement of corpses in the parish of St Martin in the Fields, indicating that for most of the period between 1748 and 1824 the proportion of imported burials was about 10 per cent, but with peaks above 10 per cent in 1763–78 and 1818–23.[24] They have also presented evidence to show that the parish of St

22 V. Harding, *The dead and the living* (Cambridge, 2002), 57.

23 J. Boulton, 'The marriage duty act and parochial registration in London, 1695–1706', in K. Schürer and T. Arkell eds, *Surveying the people* (Oxford, 1992), 249, fn. 83

24 Boulton and Schwarz, 'Yet another inquiry', 38.

Table 3 Patterns of residence in London burial registers[25]

Parish	Date	Number of children	Proportion of non-resident children (%)	Number of adults	Proportion of non-resident adults (%)
St Sepulchre Holborn	1736	100	0	100	2
St Botolph Aldgate	1736	100	0	100	2
St Dionis Backchurch	1736–1746	100	0	100	12
St Michael Cornhill	1736–1753	100	2	100	12
St James Clerkenwell	1736	100	5	100	3
St Dunstan in the West	1736	100	13	100	9
St George Bloomsbury	1736	100	13	100	17
St Paul Covent Garden	1736	100	33	100	47

Anne's, Soho, attracted a large number of imports through the cheapness of its burials, with between 60 and 80 per cent of burials imported from neighbouring parishes in the period 1750–91.[26]

In his discussion of the bills of mortality in 1759, Birch quoted figures for one Westminster parish where 261 corpses—21.2 per cent of the total dying—were carried out for burial in other parishes, and 124—10.1 per cent—were brought in for burial.[27] It is not clear whether the cases carried out of the parish were transferred to parishes within the bills of mortality, but Birch noted and that 'great numbers' were buried outside in the country, diminishing the overall accuracy of the bills.[28]

There is no comprehensive data on the traffic in corpses in other places, although there is some additional evidence available for individual parishes. Table 3 summarises data on London parishes selected from the London burial registers in the Society of Genealogists' Library, focusing on the year 1736, and selecting the first 100 child and first 100 adult burials from each register.

There were generally fewer children than adults who were not resident in their parish of burial, although there were significant numbers of non-resident children in some parishes. The proportion of non-residents varied greatly by parish, with few in St Sepulcre Holborn and St Botolph Aldgate, but substantial numbers in St Dunstan in the West, St George Bloomsbury and St Paul Covent Garden. The evidence reviewed indicates that the traffic in corpses was extensive in some parts of London, and potentially a significant problem for reconstitution studies of individual parishes.

25 Children were either those listed as children in the register or those under the age of 21.

26 Boulton and Schwarz, 'Yet another inquiry', 41.

27 Boulton and Schwarz, 'Yet another inquiry', 45.

28 Birch, *A collection*, 5–6.

Table 4 Buried wet-nursed children in rural parishes as a proportion of total burials in the bills of mortality, 1604–1749[29]

Year	Number of nurse burials in rural parishes	Total number of burials in the bills of mortality	Proportion of nurse burials (%)
1604–1609	241	48,358	0.5
1610–1619	262	81,250	0.3
1620–1629	348	136,606	0.3
1630–1639	408	117,035	0.3
1640–1649	248	122,087	0.2
1650–1659	253	129,320	0.2
1660–1669	313	247,692	0.1
1670–1679	511	190,313	0.3
1680–1689	337	223,218	0.2
1690–1699	558	209,718	0.3
1700–1709	1,133	209,434	0.5
1710–1719	835	238,261	0.4
1720–1729	1,025	273,615	0.4
1730–1739	577	260,875	0.2
1740–1749	257	260,601	0.1

Some scholars have emphasised the importance of the burial of wet-nursed children in distorting calculation of infant mortality rates.[30] Many wet-nursed children were buried outside their home parish, but the extent of the practice has probably been exaggerated. Gillian Clark has analysed the number of nurse children listed in the burials registers of rural parishes in the counties surrounding London for the period 1540–1750.[31] Table 4 summarises the number of buried wet-nursed children as a percentage of all burials in the bills of mortality.

The proportion of wet-nursed children never rose about 0.5 per cent of the total number of burials in London, suggesting that is was a relatively minor factor in distorting the measurement of infant mortality levels. There were probably more dead wet-nursed children than traced by Clark, but the number of burials in the bills of mortality was also understated, and there would have been many other burials in London outside of the area of the bills. It is possible that the wealthy resorted more frequently to wet-nursing than the general population, but Clark has presented evidence for the frequent use of such nursing amongst families with modest incomes.[32] Even if the wealthy were the main

29 The number of buried wet-nurse children are taken from Clark, *The nurse*, 110–13; burials in the bills of mortality are from J. Marshall, *Mortality in the metropolis* (London, 1834) and W. Maitland, *The history and survey of London* (London, 1775), 738, 739.

30 R. Finlay, *Population and metropolis: the demography of London, 1580–1650* (Cambridge, 1981), 99, 105; Newton in the http://www.history.ac.uk/cmh/pip/ website.

31 G. Clark, *The nurse children of London, 1540–1750: a population study* (unpublished University of Reading, D.Phil Thesis, 1988).

32 Clark, *The nurse*, 98–100.

Table 5 Mean period of parish residence of men aged 20–59, London 1703–1713

Age group 20–29		Age group 30–39		Age group 40–49		Age group 50–59	
Mean age (N = 100)	Mean years of residence	Mean age (N = 100)	Mean years of residence	Mean age (N = 100)	Mean years of residence	Mean age (N = 100)	Mean years of residence
25.1	7.1	34.5	8.9	43.6	13.2	52.9	15.4

users of wet-nurses, Table 4 suggests that the burials of wet-nursed children did not occur on a sufficient scale to significantly distort the registration of infant mortality.

Population mobility

For reconstitution purposes, ideally there would be no geographical mobility in order to track families from birth through to marriage and death. London's population is known to have been highly mobile for most of its history, although there is no systematic evidence covering the whole population for the parish register period.

Probably the most valuable source for the study of migration is the Consistory Court of London Depositions which cover a wide range of socio-economic and age groups in virtually all London parishes. Deponents usually provided detailed information on their parish of residence, age, birthplace, and duration of residence. Cliff Webb has edited the depositions for the period 1703–1713, enabling research of the migration patterns of deponents in this period.[33] Table 5 summarises an analysis of the average period of residence of men, with the first 100 cases selected for each age group.

The number of years lived in London parishes was relatively limited, although the average period of residence rose from a minimum of 7 years for the 20–29 age group to a maximum of over 15 years for the 50–59 age group. The overall proportion of men living in their parish of birth was only 6 per cent in this London sample, which can be contrasted with the 22 per cent of men living in their birthplace in a sample of 50 men living in Essex, Hertfordshire and other rural parishes listed in the Consistory records.[34] This suggests that it is much less feasible to carry out a total reconstitution study in London than it is elsewhere. However, the requirements for a study of infant mortality are much less exacting. Table 5 indicates that the mean age of residence in London for men over the age of 40 when many families would have completed their fertility was over 13 years, a sufficient period in which to establish patterns of infant mortality.

It is likely that the proportion of natives living in their parish of birth rose in London during the eighteenth century. The following table summarises data on the geographical residence of the fathers of apprentices indentured in London during 1570–1799.

33 C. Webb, *London bawdy courts, 1703–13* (London, 1999).

34 Webb, *London bawdy courts*.

Table 6 Geographical residence of fathers of plumbers' and masons' apprentices indentured in London during 1570–1799[35]

Period	Number of plumbers' apprentices	Proportion of fathers residing outside London (%)	Number of masons' apprentices	Proportion of fathers residing outside London (%)
1570–1649	88	85	–	–
1650–1699	140	71	994	68
1700–1749	129	57	884	37
1750–1799	56	39	347	32

There is a linear trend in the reduction of the percentage of fathers living outside London for both plumbers' and masons' apprentices, making reconstitution research more difficult in the earlier period but easier in the later one.

Infant death before baptism

Earlier research has indicated that the interval between birth and baptisms widened significantly in England during the late eighteenth and early nineteenth centuries.[36] Berry and Schofield included 11 London parishes in their study of birth/baptism intervals, and concluded that 'in the late seventeenth century all London parishes, irrespective of wealth of their inhabitants, were baptising early and the range of birth/baptism intervals both within and between parishes was small. During the eighteenth century the average birth/baptism interval grew steadily longer, so that by the beginning of the eighteenth century the London parishes were amongst the latest-baptising parishes in the country.'[37] Data is available for four London parishes covering the period 1695–1807, and the birth/baptism intervals by which 75 per cent of samples had been baptised are as follows.

There was a significant increase in birth/baptism intervals in all four parishes in the eighteenth century, which was particularly marked in the period after 1771. The St Bartholomew the Less baptism register lists for most of the period 1650–1812 the date of birth and baptisms, and analysis of this data confirms the overall pattern depicted in Table 7.

In the second half of the seventeenth century the great majority of infants were baptised within two weeks, whereas by the beginning of the nineteenth century most children were baptised between two and six weeks. An increasing allowance must be made for infants

35 P. Razzell and C. Spence, 'The history of infant, child and adult mortality in London, 1550–1850', *The London Journal*, 32 (2007), 286.

36 B.M. Berry and R.S. Schofield, 'Age at baptism in pre-industrial England', *Population Studies*, 25 (1971); P. Razzell, *Essays in English Population History* (London, 1994), 104, 105; J. Perkins, 'Birth-baptism intervals in 68 Lancashire parishes, 1646–1917', *Local Population Studies*, 85 (2010), 11–27.

37 Berry and Schofield, 'Age at baptism', 460.

Table 7 **Birth/baptism intervals in days by which 75 per cent of samples have been baptised**[38]

Parish	Period		
	1695–1704	1771–88	1795–1807
St Benet, Paul's Wharf	16	49	98
St Martin Orgar	11	30	65
St Mary Aldermanbury	20	28	96
St Vedast	13	30	178

Table 8 **Birth/baptism intervals in St Bartholomew the Less, 1650–1812**[39]

Period	Proportion under two weeks (%)	Proportion above two but below six weeks (%)	Proportion above six weeks (%)	Total number in sample
1650–1699	89	10	1	583
1700–1749	57	43	1	753
1750–1799	22	70	8	457
1800–1812	1	65	34	71

dying before baptism in calculations of infant mortality based on parish registers in the late eighteenth and early nineteenth centuries. Using civil registration data and evidence from a number of different parishes in England suggests that about 5 per cent of all infants died before baptism in the period 1838–55.[40] However, reliable estimates of the number of deaths before baptism for the parish register period in London will only be possible with larger samples, and more accurate data on infant mortality before the advent of civil registration.

The under-registration of burials and baptisms

Boulton and Schwarz have noted evidence for the negligence of parish clerks in making returns of the number of burials to the Company of Parish Clerks. Birch claimed in 1759 that there were many omissions of returns, and that 'this is often ascribed to negligence.' Likewise, Black wrote in 1781 of the 'scandalous neglect' of some parish clerks in making returns of burials.[41] However, negligence was not confined to parish clerks. A former Master of the Parish Clerk's Company complained in 1765 that 'Clerks in Orders of large parishes … for the most part baptise and bury without their deputy Clerk, and therefore their returns are greatly deficient.'[42]

38 Berry and Schofield, 'Age at baptism', 456–7.

39 Razzell and Spence, 'History of infant', 278.

40 Razzell, *Essays*, 145–7.

41 Boulton and Schwarz, 'Yet another inquiry', 31.

42 Boulton and Schwarz, 'Yet another inquiry', 43.

Previous research comparing information in wills and burial registers for Bedfordshire and other English parishes indicated that approximately a quarter of all deaths in the period 1538–1850 went unregistered, and that this was mainly a result of clerical negligence.[43] Similar work has been undertaken for London in the period 1538–1750, selecting the first 100 wills of men from a list of abstracts, covering a total of 26 parishes.[44] Information on the date of the will and the date of probate was extracted, defining the time period in which the person had died. The sample also included information on the intended parish of burial, which in nearly all cases was where other family members had previously been buried. Of the 100 cases, 22 could not be traced in the burial register,[45] suggesting a substantial degree of under-registration. It is likely that the registration of the burial of children from the general population was even more defective.

It is possible to further evaluate the adequacy of burial registration through the analysis of a 'Searchers Reports' register for Bloomsbury in the period 1771–1834, which gives details of people dying in the parish but buried in other London parishes.[46] The register appears to have been compiled by the local clergyman or parish clerk, for in addition to the details contained in searchers' reports—the name, age and cause of death—it also lists data on the 'abode' and 'where buried'.[47] For the period 1771–99 the returns on age and cause of death are sporadic, but information on 'abode' and 'where buried' is nearly always given. It is not clear why the register was compiled, as in the early period most of the returns of deaths concentrated on details of people buried outside of the parish. It is possible that the register was compiled in order to collect fees on 'extra-mural' burials,[48] although in the later period it appears to have covered all deaths occurring in the parish. The searchers reports register is unique in allowing the direct measurement of the actual number of burials registered in London parish registers, and an analysis was carried out on all cases in the periods 1771–74 and 1801–07, and the following table summarises the data for the two periods combined.

43 P. Razzell, C. Spence and M. Woollard, 'The evaluation of Bedfordshire burial registration, 1538–1851', *Local Population Studies*, 84 (2010).

44 The wills were selected from J.B. Whitmore, *London will abstracts,* MS, Society of Genealogists, MX 142–154, and the 26 parishes are: Allhallows the Great, Christchurch, St Andrew by the Wardrobe, St Andrew Holborn, St Antholin, St Augustine, St Bartholomew the Great, St Benet Gracechurch, St Benet Paul's Wharf, St Botolph Without Bishipgate, St Dionis Backchurch, St Dunstan in the East, St Dunstan in the West, St Giles Without Cripplegate, St Magnus the Martyr, St Martin Orgar, St Mary at Hill, St Mary Magdalen Milk Street, St Mary Woolnoth, St Michael le Querne, St Michael Queenhithe, St Olave Old Jewry, St Peter Cornhill, St Peter le Poer, St Sepulchre, The Temple.

45 A search was made both in *Boyd's London burials* (Boyd 1935) and the burial register of each individual burial register located in the Society of Genealogical Library and the Ancestry online digital collection of London burial registers.

46 The searchers reports register is deposited in the London Metropolitan Archive, reference P82/GE01/063.

47 The register is in the same hand-writing throughout, and presumably was compiled sometimes after 1834 from detailed searchers reports and other evidence.

48 The right to levy fees on parishioners buried outside parishes was legally established during the eighteenth century. See Richard Burn, *Ecclesiastical Law,* I (London, 1767), 245–7; T.W. Laqueur, 'Cemeteries, religion and the culture of capitalism', in J. Garnett and C. Matthew eds, *Revival and religion since 1700. Essays for John Walsh* (London, 1993), 190–1,196. I am grateful to Jeremy Boulton for these references.

Table 9 Deaths in the Bloomsbury searchers reports register compared to entries in local burial registers, 1771–74 and 1801–07[49]

Stated parish of burial in the searchers reports register	Burial traced in the parish register, 1771–74 and 1801–07	Burials not traced in the parish register, 1771–74 and 1801–07	Total
St Giles in the Fields	71	25	96
St Anne Soho	59	16	75
St George Bloomsbury	57	7	64
St George the Martyr	43	2	45
St Andrew Holborn	20	6	26
St James Picadilly	17	8	25
Whitfields Chapel	16	3	19
St Pancras	6	12	18
St James Clerkenwell	7	3	10
St Martin in the Fields	6	4	10
St Paul Covent Garden	8	1	9
St Marylebone	4	3	7
St John Hackney	5	2	7
St George Hanover Square	5	1	6
St Mary Islington	5	1	6
St Clement	0	4	4
Bunhill Fields	2	1	3
St John Hampstead	3	0	3
St Luke Old Street	3	0	3
St James Paddington	2	1	3
St Paul Hammersmith	2	0	2
St Sepulchre Holborn	1	1	2
St Mary Whitechapel	2	0	2
St Ann Blackfriars	0	2	2
St Botolph Bishopsgate	2	0	2
St Mary Aldermary	1	1	2
St Botolph Aldgate	1	1	2
St Dunstan West	2	0	2
Holy Trinity Clapton	1	0	1
St Paul Shadwell	1	0	1
St Giles Cripplegate	1	0	1
St Andrew Enfield	1	0	1
St Mary Newington	0	1	1
St Mary le Strand	1	0	1
Pentonville	1	0	1
St Dunstan East	1	0	1
St Matthew Bethnal Green	1	0	1
All Saints Edmonton	1	0	1
St Andrew Enfield	1	0	1
Total	360	106	466

49 All burials in the years 1771–74 and 1801–07 were searched for in available parish registers for one week before and one month after the date listed in the searchers reports register. 67.0 per cent of burials were traced to within one day of the date in the searchers register.

Although the numbers are small, there is considerable variation in the proportion of burials traced in different parish registers, and this is probably the result of differences in clerical negligence.[50] Some parishes had very low proportions of untraced cases—for example only 2 of the 45 deaths in St George the Martyr were not traced—suggesting that burial registration was very accurate in some parishes. The total number of cases in Table 9 suggests that about 23 per cent of all deaths went unregistered in London parish registers in the late eighteenth and early nineteenth century. There was little difference in the proportions of untraced cases in the two periods 1771–74 and 1801–07—23.5 per cent and 22.4 per cent[51]—and these levels are similar to that found in the comparison of wills with burial registers in the period 1538–1750—22 per cent—suggesting minimal changes in the long-term accuracy of burial registration.

There were probably similar difficulties in the registration of births. Clark in her study of wet-nurses attempted to trace the baptisms of the children dying in rural parishes but born in London in the period 1540–1750. Of her sample of 1,029 nurse children it was only possible to trace 20 per cent of baptisms in the parish of parental residence or the International Genealogical Index, which included 90 per cent of London parishes.[52] For about half the sample information was available on the parents' parish of residence, at least the father's name and sometimes trade, and even for this group the success rate in tracing baptisms was again approximately 20 per cent, and a sub-sample which included names of both parents had the same proportion of successful traces.[53] There were some changes in the successful trace rate over time, varying from 24 per cent in 1550–99, to 25 per cent in 1600–1649, 10 per cent in 1650–1699 and 19 per cent in 1700–1749.[54]

Clark concluded from her research that

> While it has been possible to offer reasons for some of the deficiencies of baptism records (such as the rite taking place in the home, in the employer's home, or in the nurse parish), failure to find families in the 1638 and 1695 [enumeration] lists, or to find men in company records considered to be reasonably complete, does lead to the conclusion that there was under-recording on many levels.[55]

This conclusion is confirmed by the study of baptism registration in the parish of Hackney, which was included in the London bills of mortality. It was not possible to trace in the

50 There are over 9,000 cases in the Bloomsbury Searchers' Reports Register in the period 1771–1834, enabling future detailed research on parish variation in register reliability.

51 The total untraced burials in 1771–74 was 50 out of a total of 215, and 56 out of a total of 251 in 1801–07.

52 Clark, *The nurse*, 74.

53 Clark, *The nurse*, 75.

54 Clark, *The nurse*, 76.

55 Clark, *The nurse*, 411.

baptism register 70 per cent of the individuals aged 51–90 and listed as born in Hackney in the 1851 census, suggesting major Anglican under-registration of births in this London parish in the last four decades of the eighteenth century.[56]

Data is available on infant burials in St James, Clerkenwell, in the period 1736–53, which allows an assessment of baptism registration in this large parish, which is a central part of the 'People and Place' project. Of the first 100 infant burials in each of the years 1736 and 1741, only 44 and 42 could be traced in the baptism register or the International Genealogical Index—a total trace rate of 43 per cent. This low trace rate, along with the evidence on burial registration summarised in Table 2, suggests that parish registration was very defective in Clerkenwell at this time. This is confirmed by an analysis of infant mortality rates during this period. The IMR calculated by the 'People and Place' reconstitution project is 338 per 1,000 in the period 1735–53,[57] but the calculation of aggregate infant mortality expressing the number of infant deaths as a proportion of baptisms for the same period is 638 per 1,000 (3,163 infant burials expressed as a proportion of 4,956 baptisms).[58]

It would appear from the distribution of ages in the Clerkenwell burial register, that infants were defined as children dying under the age of two, a similar category to that used in the bills of mortality. In the 'People and Place' reconstitution schedules for the period 1736–40, there were 682 infant dying under the age of one, and 95 children dying between one and two, with a total of 777 children dying under the age of two. Using this number of deaths by age allows a correction of the 3,163 infant burials above, by multiplying it by the ratio 682/777, giving a total of 2,777 infant deaths under one year. This number yields a new infant mortality rate of 560 per 1,000, very significantly higher than the published reconstitution IMR of 338 per 1,000. Given all the problems and uncertainties about the quality of both bills of mortality and parish registers, it is necessary to look elsewhere for reliable ways of measuring infant mortality.

The use of the same-name method for correcting infant mortality rates

Finlay, in his reconstitution study of infant mortality in six London parishes in the sixteenth and seventeenth centuries, found varying rates, some of which were very low. The following rates are all per 1,000 baptisms: All Hallows Bread Street, 1538–1653: 83; St Peter Cornhill, 1580–1650: 107; St Christopher le Stocks, 1580–1650: 55; St Michael Cornhill, 1580–1650: 109; St Mary Somerset, 1605–1653: 256; St Botolph Bishopgate,

56 Razzell, *Essays*, 96.

57 G. Newton, 'Infant mortality variations, feeding practices and social status in London between 1550 and 1750' *Social History of Medicine* (Advance Access published August 27, 2010), 16; R. Smith and S. Szreter, 'Reproducing generations', *Wellcome History*, 42 (2009), 10.

58 The infant burials are taken from the *St James Clerkenwell parish register* (Harleian Society Registers XVII, 1891), the baptisms from the 'People and Place' dataset.

1600–1650: 153.[59] Finlay was surprised by the low rates in some of the parishes, and suggested that these might have been the result of wet-nursed children dying away from home and being excluded from calculated rates.[60] However, as we have seen in Table 4, the number of buried wet-nurse children as a proportion of all London burials was under 0.5 per cent in the first half of the seventeenth century, indicating that dead wet-nursed children are not a satisfactory explanation of very low infant mortality rates.

The name of a dead child was often given to a subsequent child of the same sex, allowing an independent method of measuring burial registration reliability, and Finlay considered using the same-name method to correct for burial under-registration.[61] He rejected the method mainly on the grounds that some same-name children may have been living at the same time, undermining the central assumption of a dead child linked to a subsequent child of the same sex. Evidence from will abstracts for different areas of England suggests he was correct for the sixteenth century—particularly for the first half of the century—but living same-name children appear to have virtually disappeared in England by the seventeenth century.[62]

The following table summarises available data on will abstracts from a number of church courts in London. Table 10 indicates that there were high proportions of living same-name children in the early sixteenth century, but the proportion was declining rapidly by the early seventeenth century. This may have been partly the result of the introduction of parish registration, with parents having to formally name their children, and was possibly linked to the decline of children being named after godparents.[63]

The practice of giving the name of a dead child to a subsequent sibling of the same sex was very widespread. In six rural parishes the proportion of eligible families using same names varied between 50 and 73 per cent,[64] whereas the percentage was lower in eight London parishes, at 33 per cent.[65] Same-name analysis is in effect an independent method of studying infant mortality, as it is known that an infant or child has died between the death of an older sibling and the baptism of a subsequent child of the same name. Except for death before baptism, the method enables the correction of all forms of burial under-registration: a child being buried outside its parish of baptism, including wet-nursed children; the non-registration of burials due to clerical negligence; the

59 R.A.P. Finlay, 'The accuracy of the London parish registers, 1580–1653', *Population Studies*, 32 (1978), 99.

60 Finlay, 'Accuracy'.

61 For a full discussion of the use of the same-name method see Razzell, *Population and disease*, 3–18.

62 See P. Razzell, 'Living same-name siblings in England', below, 65–9.

63 R. Houlbrooke, *The English family 1450–1700* (London, 1984), 131.

64 Houlbrooke, *English family*, 9.

65 See Razzell and Spence, 'The history', 273–76 for details of the research on these parishes based on Boyd's families of London dataset. There were 698 eligible families—with children of the same sex as an older dead sibling—232 of whom were given the same first name.

Table 10 Living siblings with the same names in will abstracts with at least two siblings of the same sex, 1439–1699[66]

District	Date of Will	Number of of living same name siblings	Total number of siblings	Proportion of living same name siblings (%)	Sample
London Consistory Court	1492–1547	6	49	12.2	All Families
Surrey Archdeaconary Court (London*)	1537–1541, 1558–1560	6	194	3.1	All Families
Surrey Archdeaconary Court (London*)	1608–1615, 1615–1623, 1620–1631	0	288	0.0	First 100 Families
London Commissary Court	1629–1634	4	640	0.6	First 100 Families
London Commissary Court	1644–1646	0	149	0.0	All Families

Notes: *Includes Southwark, Bermondsey, Lambeth, Wandsworth, Battersea and Rotherhithe.

Table 11 Burial registration accuracy using the same name and enumeration listing/parish register comparison methods, 1681–1709[67]

	Children baptised with same names searched for in the burial register	Children baptised but not buried and searched for in the enumeration listing
Number traced	97	206
Number not traced	48	110
Total number	145	316
Proportion not traced (%)	33.1	34.8

failure to identify the burial of a child because of poor inadequate information in the burial register.

Previous research suggests that same-name children are a representative sample, indicated by comparisons with other methods of evaluating burial registration reliability. Table 11 summarises the results of reconstitution study of 16 London parishes comparing same name analysis with research tracing baptised children in the London 1695 Marriage

66 I. Darlington, *London consistory court wills, 1492–1547*, London Record Society, 3 (1967); C. Webb ed., *Archdeaconary Court of Surrey Will Abstracts, 1537–41, 1559–60, 1608–15, 1615–23, 1620–31* (Transcripts in London Metropolitan Archives); *Commissary Court of London will abstracts, volume 26 (1629–1634)*, www.Genuki.org.uk/big/eng/Wills/Wills.1.html; *Commissary Court of London will abstracts, volume 29 (1644–5–1646)*, www.Genuki.org.uk/big/eng/Wills/Wills.3.html

67 Razzell, *Population and disease*, 12–14. The same-name children were from reconstitution schedules covering the period 1681–1709, whereas the enumeration listing/ parish register sample were all children baptised in the period 1685–1694.

Duty Enumeration Listing. The latter children were all baptised less than ten years previous to 1695 and not listed in the burial register.

The levels of untraced children are similar using both methods, suggesting that the same-name method is a reliable way of measuring burial under-registration. Of 37 eligible same-name children not traced in the burial register, none were found in the enumeration listing, confirming the validity of the assumption that a missing same name case is the equivalent to an unregistered burial.

The proportion of untraced deaths in Table 11 using the same-name method (33.1 per cent) is higher than that found in the wills/burial register comparison method and the data derived from the Bloomsbury searchers' register summarised in Table 9, which was of the order of 22 to 23 per cent. However, the same-name method in addition to unregistered deaths also includes missing burials due to the traffic in corpses and, as we saw earlier, this is possibly of the order of 10 per cent, making the various measures of burial under-registration consistent with each other. These figures are for different periods and parishes, and in future it will be necessary to coordinate the measurement of burial registration using different methods for the same parishes and periods.

It is also possible to apply the same-name method to the measurement of baptism registration reliability. This involves the analysis of two or more burials of a same name child, attempting to trace the baptism of the older sibling. Of 178 same-name burials in Clerkenwell in the period 1538–1753, 50 (21.9 per cent) could not be traced in the baptism register,[68] suggesting that more than a fifth of births were not registered, similar to the overall proportion of untraced wills in London burial registers in the period 1538–1750, and the untraced burials in the early 1770s and 1800s summarised in Table 9.

The above finding raises a difficulty about a central assumption made by the 'People in Place' project regarding burials which cannot be linked to previous baptisms. The project has adopted the assumption that all such burials are the result of children dying before baptism, and has created dummy baptisms with a date of birth identical to the date of burial.[69] The evidence reviewed above suggests that most missing baptisms were the result of birth under-registration, and this is consistent with what is know about Anglican canon law which forbade the ceremony of burial and the registration of unbaptised children.[70]

68 This analysis was carried out on the first 13,000 cases in the Clerkenwell reconstitution schedules in the 'People in Place' dataset.

69 For a discussion of this assumption see E.A. Wrigley, R.S. Davies, J.E. Oeppen and R.S. Schofield, *English population history from family reconstitution 1580–1837* (Cambridge, 1997), 239–40. The 'People in Place' project has also allocated stillbirths to the number of dummy baptisms where they can be assigned to a particular family reconstitution schedule.

70 Cox, the author of a book on English parish registers wrote, 'the Church forbade the ceremonial internment of all excommunicated or unbaptised persons … and that the insertion of such burials in the registers was only fitful and irregular.' J.C. Cox, *The parish registers of England* (London, 1908), 98.

Table 12 The proportions of dummy baptisms in Clerkenwell and Cheapside, 1538–1753[71]

	Period	Number of baptisms	Number of dummy baptisms	Proportion of dummy baptisms (%)
Clerkenwell	1550–99	1,859	94	5.1
	1600–49	7,813	619	7.9
	1650–99	11,760	1,372	11.7
	1711–14	1,344	68	5.1
	1735–53	5,946	1,115	18.8
Cheapside	1538–99	2,433	19	0.8
	1600–49	2,239	77	3.4
	1650–99	1,927	74	3.8
	1700–24	520	0	0.0

Rickman raised in the questions to clergymen about the parish register returns in the 1801, 1811, 1821, 1831 and 1841 censuses, the following query:

> Are there any Matters, which you think it to remark, in Explanation of your Answers to … Whether any or what Annual Average Number of Baptisms, Burials, and Marriages, may (in your opinion) take place in your Parish, without being entered in the Parish register.[72]

Rickman concluded from the answers to this question that 'children who die before baptism are interred without any religious ceremony, and consequently are not registered', a conclusion that he repeated in all the census publications for which he was responsible.[73] A manuscript giving the answers of clergymen to the above question in 1811 has survived and is deposited in the British Library. The great majority of responses indicate that the burials of unbaptised children were not registered.[74] Even where unbaptised children were listed in the burial register, they invariably did not give a first name to the child,[75] and therefore would not be included in any reconstitution analysis.

The proportions of dummy baptisms in the two main samples in the 'People in Place' project are as shown in Table 12, above. There were marked variations in the proportions of dummy baptisms both over time and between the different parish groupings. The number of dummy baptisms was larger in Clerkenwell than in Cheapside, and was particularly high in the period 1735–53 (18.8 per cent) adding in effect 188 infant burials

71 The source of this data is the 'People in Place' dataset, UK Date Archive.

72 *Enumeration Abstract 1811 Census*, xvii.

73 See the *Enumeration Abstracts* to the 1801, 1811, 1821, 1831 and 1841 censuses.

74 *Population Act 1811. Parish Register Abstract. Remarks made in Answer to the 3rd Question addressed to the Reverend the Officiating Ministers in England* (British Museum Add. MS 6896).

75 See for example the Cardington, Bedfordshire burial register for the period 1737–1812 and the Kempton, Bedfordshire burial register for 1801–12.

per 1,000 baptisms to the calculated infant mortality rate for this period.[76] This creates major problems for the accurate measurement of infant mortality, particularly as all the children covered by dummy baptisms are assumed to have died on the first day of birth.

Conclusion

A review of evidence on the London bills of mortality and parish registers indicates that there were major registration problems throughout the whole of the period between the sixteenth and nineteenth centuries. With the bills of mortality this was the result of the exclusion of many people on the grounds of religious dissent or the existence of burial grounds outside those officially recognised by the company of parish clerks. Also, there is evidence that some of the dead were removed to parishes outside of London, and this was particularly the case with wealthy families. More importantly, there is evidence that many parish clerks were very negligent in making returns of deaths to the Company of Parish Clerks.

There has been an attempt to address the problem of the unreliability of the bills by using reconstitution techniques on individual parish registers. There are, however, major problems with reconstitution studies of London parishes, resulting from the traffic in corpses between parishes both inside and outside of London, including the burial of wet-nursed children, and the negligence of clergymen in registering both baptisms and burials. It is likely that the latter was the major factor in under-registration. The same-name and census/parish register research suggests that on average at least a third of all burials went unregistered in parish registers on the above accounts.

London provides a very fruitful focus for further research because of the abundance of its demographic data, allowing the triangulation of sources and the detailed evaluation of different methods of measuring burial registration accuracy. Only when more research of this kind has been done will it be possible to fully clarify the history of infant mortality in London during the three centuries between 1538 and 1837, a period of major economic and social transformation.

76 The large number of dummy baptisms for this period is probably partly the result of the lack of information on parents names, the 'People in Place' project relying mainly on data on surname and infant burials for nominal record linkage.

Debate

Living same-name siblings and English historical demography: a commentary

Peter Razzell

Chris Galley, Eilidh Garrett, Ros Davies and Alice Reid have rightly called for further research on living same-name siblings in England, including its implications for the study of mortality and historical demography.[1] They note three instances of living same-name siblings in the published London and Bristol 1695 Marriage Duty Act assessments, although they conclude that more data is required to establish the exact extent of the practice during the parish register period.[2]

What is required is a systematic study of all available data at a particular period, and fortunately there are a number of Marriage Duty Act and other enumeration listings that have survived for different parts of the country for the late seventeenth century. The following table examines all available data and summarises an analysis of eligible families with two or more siblings of the same sex, and the proportion of these families with two living same-name siblings.

There were nine same-name sibling pairs out of 6162 eligible families, 0.15 per cent of the total—an insignificant number.[3] With the exception of the one case in Chiseldon in 1705, there were no living same-name siblings traced in any of the rural and provincial places outside of London and Bristol. A close examination of the nine pairs of apparent living same-name siblings raises doubts about whether even these were genuine cases. The London example quoted by Galley et.al. is as follows:

St. Mary Staining Parish. Jeremiah Lammas, Ann daughter, Edward son, Ann daughter, Charles son, Peter son, Jeremiah son.[4]

1 Chris Galley, Eilidh Garrett, Ros Davies and Alice Reid, 'Living same-name siblings and English historical demography: a reply to Peter Razzell' *Local Population Studies*, 87 (2011), 77.

2 Galley et.al., 'Living same-name siblings', 72.

3 These nine cases included the three pairs noted by Galley et.al., 'Living same-name siblings', 72.

4 Galley et.al., 'Living same-name siblings', 72.

Table 1: Living same-name siblings in 1695 Marriage Duty Act enumeration listings.[5]

Place	Date	Number of eligible families	Number of living same-name sibling pairs	Percentage of living same-name siblings
Bristol, Gloucestershire	1696	2,282	4	0.18
City of London	1695	2,189	4	0.18
Lichfield, Staffordshire	1695	275	0	0
Stoke-on-Trent, Staffordshire	1701	177	0	0
Lyme Regis, Dorset	1695	112	0	0
Lyme Regis, Dorset	1698	118	0	0
Lyme Regis, Dorset	1703	116	0	0
Swindon, Wiltshire	1697	76	0	0
Melbourne, Derbyshire	1695	55	0	0
Wanborough, Wiltshire	1697	51	0	0
Wanborough, Wiltshire	1701	49	0	0
Wanborough, Wiltshire	1702	50	0	0
Wanborough, Wiltshire	1705	40	0	0
Chiseldon, Wiltshire	1697	41	0	0
Chiseldon, Wiltshire	1701	51	0	0
Chiseldon, Wiltshire	1702	62	0	0
Chiseldon, Wiltshire	1705	51	1	2.0
Wroughton Wiltshire	1700	41	0	0
Wroughton Wiltshire	1701	39	0	0
Clayworth, Nottinghamshire	1676	32	0	0
New Romney, Kent	1696	30	0	0
New Romney, Kent	1697	30	0	0
New Romney, Kent	1699	34	0	0
Liddington, Wiltshire	1701	30	0	0
Liddington, Wiltshire	1702	29	0	0
Goodnestone, Kent	1676	24	0	0
Southampton, Hampshire	1695	17	0	0
Elcombe, Wiltshire	1700	10	0	0
Elcombe, Wiltshire	1701	12	0	0
Bincknoll, Wiltshire	1697	10	0	0
Bincknoll, Wiltshire	1700	9	0	0
Bincknoll, Wiltshire	1701	7	0	0
Old Romney, Kent	1699	7	0	0
Uffcot, Wiltshire	1700	6	0	0
Total		6,162	9	0.15

5 For the sources of this data see D.V. Glass ed., *London inhabitants within the walls1695* (London, 1966); E. Ralph and M.E. Williams eds., *The inhabitants of Bristol in 1696,* Bristol Record Society, 15 (1968); D. A. Gatley ed., *The Stoke-upon-Trent parish listing, 1701,* Staffordshire Record Society, Collections for a history of Staffordshire, 4th series, 16, (1994); R.E. Chester ed., 'A statutory list of inhabitants of Melbourne, Derbyshire, in 1695', *Journal of the Derbyshire archaelogical and natural history society,* 7 (1885), 7–23. The Wiltshire data was taken from Beryl Hurley ed., *Local censuses in Wiltshire: surviving north Wiltshire 1695 tax censuses, Part 1,* Wiltshire Family History Society (1994), 4, 5 and Hurley, *Local censuses, Part* 2,16–44, 46–53. All other data were taken from manuscript listings kindly supplied by the library of the Cambridge Group.

A search in the International Genealogical Index reveals the following pattern of baptisms to Jeremiah and Ann Lammas in St. Mary Staining:

Charles baptised 8/1/1676.
Jeremiah baptised 5/2/1678.
Edward baptised 2/8/1680.
Anne baptised 1/9/1682.
Jeremiah baptised 5/2/1685.
Mary baptised 16/10/1685.
Sarah baptised 10/2/1686.
Charles baptised 5/6/1688.
Peter baptised 30/1/1689.
Jeremiah baptised 16/4/1691.
Ruth baptised 14/1/1692.
Joseph baptised 11/1/1694.
Martha baptised 29/3/1698.

Some of the dates are confused possibly because of the use in some instances of the Julian calendar, but the above list of baptisms indicates that there was only one Ann born to Jeremiah and Ann, although there were three Jeremiahs, only one of whom appears to have survived until 1695. In the light of this anomaly, a search was made of the original manuscript of the 1695 Marriage Duty Act assessment, which revealed the following entry:

Jeremiah Lammas, Ann his wife, Edward son, Ann daughter, Charles son, Peter son, Jeremiah son.[6]

Ann had mistakenly been transcribed as a daughter in the published volume edited by David Glass, an error perhaps understandable given the large number of cases included in the edition. There are three other apparent living same-name cases in London, but it has not been possible to trace the baptisms of the three families. The first family is that of Samuel and Hannah Dangicourt, which in the published volume are listed as having three children: Peter son, Elizabeth daughter, Elizabeth daughter. In the manuscript edition, the three names—Peter, Elizabeth and Elizabeth—are listed alongside Samuel and Hannah, but with no indication of their relationship with the latter, representing another transcription error. The other two families are ones where there are two same-name siblings listed, but are stated as 'children', with no indication of the relationship to the man and woman associated with them in the schedules.[7]

6 London Metropolitan Archive, reference COL/CHD/LA/04.

7 London Metropolitan Archive, reference COL/CHD/LA/04.

It has not been possible to trace the baptisms of the four families listed with living same-name siblings in the 1696 Bristol published volume. However, most assessments associated with the 1695 Marriage Duty Act have survived for the city in the period 1695–1706, allowing an evaluation of the accuracy of the 1696 volume. The spelling of names varies between one listing and another, including a wife named Eleanor being listed twice as Leonard! In the following entries I have inserted commas to clarify naming patterns, which are sometimes confused by the lack of spacing between names—and many of the problems in transcripts are due to the absence of spacing or commas in the original manuscript. The four families with living same-name siblings in the 1696 published volume are as follows, contrasted with entries for relevant other years from the manuscript sources:

1. St Nicholas parish

1696: Peeter Wading, Leonard Wading his wife. Peeter, Philip, Elizabeth, Walter & Peeter children.[8]
1695: Peter Wadding and Elionor his wife. Peter, Phillipp, Eliz, Walter and Peter Worton children.[9]
1697: Peter Wadding, Leonard his Wife. Peter, Phillip & Walter Children.[10]
Comment: The second Peter listed in 1696 is stated as being 'Peter Worton' in 1695, and disappears in the 1697 return.

2. St Philip & Jacob parish

1696: William Ellis & Hannah wife. Richard, Hannah, Elizabeth, Mary, Sampson & Hannah Ellis children.[11]
1695: William Ellis and Hannah his wife. Richard Simson, Hannah Simson, Elizabeth Simson, Mary Simson & Hannah Ellis their children.[12]
Comment: The 1695 return makes it clear that the two Hannahs had different surnames and were presumably born to different fathers. The 1696 published listing appears to have transcribed the surname 'Simson' as the first name 'Sampson'.

8 Ralph and Williams, *The inhabitants*, 139.
9 Manuscript 1695 Marriage Duty Act assessment, Bristol Record Office, reference FCTax/A/17/14.
10 Manuscript 1695 Marriage Duty Act assessment, Bristol Record Office, reference FCTax/A/17/15.
11 Ralph and Williams, *The inhabitants*, 179.
12 Manuscript 1695 Marriage Duty Act assessment, Bristol Record Office, reference FCTax/A/17/17.

3. St Stephen parish

1696: John James & Sarah wife. Joseph, Joseph, Sarah, Elizabeth children.[13]
1698: John James & Sarah his wife. John, Joseph, Sarah and Elizabeth children.[14]
Comment: As Ralph and Williams the editors of the 1696 volume noted, Joseph appears as John in the 1698 assessment,[15] suggesting a recording error in the 1696 return, and indicating that there were no living same-name siblings in this family.

4. St Michael parish

1696: Roger Bagg & Grace wife. Andrew, John, Ann, Fulean & John children.[16]
1697: Roger Bagg deceased, Grace his wife, John and Andrew sons.
Comment: It is possible that the name 'Fulean' is the surname of the children Andrew, John and Ann. A burial is noted for Roger in the 1697 manuscript assessment, inasmuch a number 1 is recorded in the burial column. There is no such note for the children, and no entry for John Bagg in the burial register for 1696–97.[17]

The extra data available on Bristol indicates that it is likely there were no living same-name siblings in Bristol at the end of the seventeenth century. This conclusion will have to be evaluated through further research on baptisms in the families in question.[18]

The remaining living same-name sibling traced was for Chiseldon, Wiltshire in 1705. The father and mother were Thomas and Mary Dereham, and the entry for 1705 was as follows: Children John, Thomas, Oliver, Richard, Richard, Edmond, Marey. However, the entry for 1702 was: Children John, Oliver, Richard, Mary.[19] It is possible that the second Richard and Edmond enumerated in 1705 were born between 1702 and 1705, but this is questionable given the short birth intervals involved, and will have to be checked if relevant baptism data can be located.

None of the above nine cases can be unambiguously classified as being living same-name siblings. Further research might provide such evidence but we can provisionally conclude that the existence of living same-name cases did not occur to any significant extent at the end of the seventeenth century. It is probable that there were such cases in an earlier

13 Ralph and Williams, *The inhabitants*, 187.

14 Manuscript 1695 Marriage Duty Act assessment, Bristol Record Office, reference FCTax/A/17/18.

15 Ralph and Williams, *The inhabitants*, 187, footnote. Ralph and Williams mistakenly referred to the 1698 return as the 1689 assessment.

16 Ralph and Williams, *The inhabitants*, 131.

17 Manuscript 1695 Marriage Duty Act assessment, Bristol Record Office, reference FCTax/A/17/13.

18 The Bristol Family History Society has transcribed most baptism registers for the period after 1754, and is planning to transcribe those before that date in the near future.

19 Beryl Hurley ed., *Local censuses in Wiltshire: surviving north Wiltshire 1695 tax censuses, Part 2* Wiltshire Family History Society (1994), 10, 13.

period, particularly during the sixteenth century, but the evidence reviewed in a previous article, suggests that the great majority of these were males and that by the seventeenth century they were less than 2 per cent of the total of eligible families.[20] Same name research suggests that between 20 and 30 per cent of all burials were under-registered in the parish register period,[21] indicating that living same-name children do not pose a major problem for the same-name technique.

20 Peter Razzell, 'Living same-name siblings in England, 1439–1851', *Local Population Studies*, 87 (2011), 67.

21 See Peter Razzell, *Population and disease: transforming English society*, 1550–1850, 15.

WILEY

The decline of adult smallpox in eighteenth-century London: a commentary

Author(s): PETER RAZZELL

Source: *The Economic History Review*, NOVEMBER 2011, Vol. 64, No. 4 (NOVEMBER 2011), pp. 1315-1335

Published by: Wiley on behalf of the Economic History Society

Stable URL: https://www.jstor.org/stable/41262532

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at https://about.jstor.org/terms

Economic History Society and *Wiley* are collaborating with JSTOR to digitize, preserve and extend access to *The Economic History Review*

This content downloaded from 146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

Economic History Review, 64, 4 (2011), pp. 1315–1335

The decline of adult smallpox in eighteenth-century London: a commentary

By PETER RAZZELL

This article is a reponse to Davenport, Schwarz, and Boulton's article, 'The decline of adult smallpox in eighteenth-century London'. It introduces new data on the parish of St Mary Whitechapel which casts doubt on the pattern of the age incidence of smallpox found by Davenport et al. However, it is concluded that there was a decline in adult smallpox in London, accompanied by a concentration of the disease among children under the age of five. Davenport et al.'s argument that the shift in the age incidence was due to the endemicization of smallpox in England is challenged, with an alternative view that these age changes can be accounted for by the practice of inoculation, both in the hinterland southern parishes of England and in London itself. A detailed discussion is carried out on the history of inoculation in London for the period 1760–1812. It is suggested that inoculation became increasingly popular in this period, rivalling in popularity the practice of vaccination. This was associated with a class conflict between the medical supporters of Jenner and the general population, with many of the latter being practitioners of the old inoculation.

Davenport, Schwarz, and Boulton have produced challenging new evidence on the history of smallpox in late eighteenth-century England, documenting in detail the decline of adult smallpox in London at the end of the century, concluding that this was the result of increasing 'endemicization' of the disease among infants and very young children.[1] This evidence is based on data for two separate parishes from different parts of London—St Martin-in-the-Fields and St Dunstan Stepney—with similar results in both parishes in terms of age patterns of smallpox mortality. However, there is additional evidence which suggests that the age incidence of smallpox in London as a whole was different to the two parishes considered by Davenport et al. The Whitechapel burial register includes detailed information on age and cause of death for the periods 1743–8 and 1760–1812.[2] The data on age are frequently to the nearest month and there is virtually a continuous record, with less than 1 per cent of data on age and cause of death missing from the burial register in the two above periods.

Table 1 summarizes a comparison of smallpox age incidence in St Martin-in-the-Fields with that in St Mary Whitechapel. There was a decline in adult smallpox deaths in Whitechapel, but it was of a lesser magnitude than that found in St Martin's. There was also an increasing concentration of smallpox mortality among children under five years old in Whitechapel, partly as a result of a decline in the five- to nine-year group. However, perhaps the most important difference is that

[1] Davenport, Schwarz, and Boulton, 'Decline'.

[2] London Metropolitan Archives (hereafter LMA), St Mary Whitechapel burial register, P93/MRY1/062–64.

© Economic History Society 2011. Published by Blackwell Publishing, 9600 Garsington Road, Oxford OX4 2DQ, UK and 350 Main Street, Malden, MA 02148, USA.

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

Table 1. *Proportion of smallpox burials by age group, 0–50+, St Martin-in-the-Fields and St Mary Whitechapel, 1743–1812*

Period	*Age group, St Martin-in-the-Fields*						
	0	*1–4*	*5–9*	*10–19*	*20–49*	*50+*	
1752–66	13.7%	54.5%	10.9%	4.6%	15.6%	0.7%	
1775–99	23.3%	61.5%	9.4%	1.8%	3.5%	0.6%	
Period	*Age group, St Mary Whitechapel*						*Total no. of cases*
	0	*1–4*	*5–9*	*10–19*	*20–49*	*50+*	
1743–8[a]	21.1%	54.7%	10.3%	2.3%	10.0%	1.7%	351
1760–9	6.5%	66.0%	14.7%	3.5%	8.8%	0.3%	919
1770–9	18.4%	61.1%	9.4%	4.0%	6.9%	0.2%	553
1780–9	19.9%	65.1%	8.5%	1.6%	4.3%	0.5%	553
1790–9	22.3%	68.9%	4.8%	0.6%	2.5%	0.4%	479
1800–12	19.6%	70.1%	7.4%	1.0%	1.5%	0.3%	581

Note: a The period covered is from 10 April 1743 to 30 Nov. 1747.
Sources: St Martin-in-the-Fields: Davenport et al., 'Decline'; St Mary Whitechapel: LMA, St Mary Whitechapel burial register, P93/MRY1/062-64.

Table 2. *Proportion of smallpox burials by age group, 0–4, St Mary Whitechapel 1743–1812*

Period	*0*	*1*	*2*	*3*	*4*	*Total no. of cases*
1743–8[a]	27.2%	19.8%	24.3%	14.6%	14.3%	268
1760–9	9.0%	31.1%	22.3%	24.1%	13.5%	668
1770–9	23.0%	25.0%	24.8%	17.5%	9.8%	440
1780–9	23.4%	28.2%	21.4%	16.6%	10.4%	471
1790–9	24.5%	26.8%	24.7%	15.6%	8.5%	437
1800–12	21.2%	28.2%	21.2%	19.2%	10.3%	543

Note: a The period covered is from 10 April 1743 to 30 Nov. 1747.
Source: LMA, St Mary Whitechapel parish registers, P93/MRY1/062-64.

the reduction of adult smallpox deaths occurred more evenly over time in Whitechapel than in St Martin's, and this may be partly a function of the quality of the data.[3] Davenport et al. comment on the rapid decline in adult smallpox in St Martin's in the period 1769–74—from 20 per cent to 10 per cent—but note that this 'coincided with a period of poor recording of age and cause [of death]' in the St Martin's register.[4] There is no such rapid decline in adult smallpox burials in Whitechapel and this may be because there are significant gaps in the burial registers of both St Martin's and St Dunstan Stepney. In St Martin's there was a gap between 1766 and 1775—an important period according to table 1—whereas the record in Whitechapel is continuous from 1760 to 1812.

The pattern of concentration of smallpox deaths in the under-five age group is also different in Whitechapel. Davenport et al. concluded that in 'the first and second six months of life . . . smallpox burials increased by nearly 50 per cent as a proportion of all burials' in St Martin's between 1752–66 and 1775–99.[5] Table 2 reveals a different pattern in Whitechapel. There is a large dip in smallpox deaths among infants under the age of one year in the 1760s, coinciding with a rise in

[3] See Davenport et al., 'Decline', fig. 1, p. 1291.
[4] Davenport et al., 'Decline', p. 1294.
[5] Ibid., pp. 25, 45.

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

Table 3. *Age specific case fatality rates of smallpox in the Whitehaven Dispensary, 1783–1804*

Age group (years)	*No. of smallpox cases*	*No. of smallpox deaths*	*Case fatality rate*
Under 2	378	139	37%
2 to under 5	665	105	16%
5 to under 10	308	32	10%
10+	36	3	8%

Source: Razzell, *Conquest*, p. xviii.

overall smallpox mortality in this decade.[6] This dip may have been a function of registration problems, as there appears to have been a rounding up of ages under one year to the age of one year in the Whitechapel burial register during the 1760s.[7] Table 2 indicates that there was no significant shift in smallpox burials from the 3–4 to the under-two age group, and there is no long-term increase in smallpox deaths among infants in the under-one age group. It is possible that the growth in smallpox burials among infants found by Davenport et al. is partly a function of the dip in such burials in the 1760s.

There are also other reasons for questioning the endemicization thesis. Smallpox was much more fatal to infants than it was to older children, as evidenced by case fatality rates in Whitehaven, Cumberland, at the end of the eighteenth century (see table 3).

Smallpox was more than twice as fatal in the under-two age group than it was to those aged between two and five, and about four times more fatal to those over the age of five. There is evidence from elsewhere of a similar pattern of smallpox case fatality among children, indicating that an increasing concentration of the disease among infants would lead to growing overall smallpox mortality.[8] We will see later that this was not the case in London, where smallpox mortality fell during the late eighteenth and early nineteenth century, casting further doubt on the endemicization thesis.

Tables 1 and 2 indicate that smallpox disappeared among adults in the period 1743–1812, and became more concentrated among children under the age of five. To this extent the findings for St Mary Whitechapel are similar to those for St Martin's and St Dunstan Stepney, but there is a divergence of results regarding the concentration of the disease among young infants. However, the elimination of adult smallpox and its concentration among young children require explanation. Davenport et al. propose two possible reasons for the virtual elimination of adult smallpox in London: firstly, an increase in childhood exposure to smallpox throughout London's migrant catchment area; and secondly, inoculation and later vaccination of virtually all London migrants.[9] The first explanation is linked to the argument that there was an increase in the infectivity of smallpox:

[6] There was also a similar rise in smallpox mortality in St Martin's and elsewhere in London. See Davenport et al., 'Decline', p. 1295.

[7] See LMA, St Mary Whitechapel burial register. There appears also to have been some rounding up of ages in the St Martin's register. See Westminster City Archive, St Martin-in-the-Fields Sexton's Burial Day Book.

[8] Razzell, *Conquest*, pp. xvii, xviii.

[9] See Davenport et al., 'Decline', p. 1297.

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

> An increase in infectiousness would have raised the chances of infection in infancy and early childhood in large urban populations, and at the same time promoted the circulation of smallpox in rural communities . . . [and as a result] the vulnerability of adult migrants would have declined, and smallpox would have become a disease of childhood in both London and its hinterland.[10]

Davenport et al. cite evidence on changes in the age pattern of smallpox among children in London in support of this first hypothesis: 'infant smallpox mortality rate doubled, while rates in older children probably declined',[11] suggesting a 'process of smallpox endemicization in the English population'.[12] This process of concentration of smallpox in young infants did not occur in Whitechapel, raising doubts about the endemicization thesis. Also, there is an alternative explanation for the changes in the age structure of smallpox in London, but first it is necessary to consider the evidence for an increase in infectivity of smallpox at the end of the eighteenth century.

I

There are no references to increasing infectivity of smallpox by medical writers in the late eighteenth century, although this is not in itself conclusive.[13] There is a theoretical relationship between the virulence of smallpox and its infectiousness, and there is evidence that the virulence of the disease was increasing during the late eighteenth and early nineteenth century.[14] However, the link between virulence and infectiousness is problematic, as indicated by evidence on smallpox mortality in sixteenth-century London. The case fatality rate was probably less than 4 per cent at this time, and yet the great majority of people dying in two London parishes were children under the age of 10,[15] suggesting that the disease could be endemic even when it was very mild in its virulence.

There are data to suggest that there were no significant changes in infectiousness at the end of the eighteenth century, both in England and abroad. There are no national data on smallpox epidemics in England during the late eighteenth century, but evidence is available for Sweden in the period 1776–1805, although the two countries are not strictly comparable. Smallpox was largely confined to children in Sweden, whereas it was a disease of both adults and children in England, at least in the south of the country. Table 4 summarizes data on the age incidence of the disease in Sweden which is largely a reflection of the periodicity of epidemics.[16]

There is a slight tendency for smallpox deaths to occur at an earlier age, but it is not sufficiently large to bring about the significant changes found in London at

[10] Ibid., p. 1308.
[11] Ibid., p. 1304.
[12] Ibid., abstract, p. 1289.
[13] There are examples of medical writers noting changes in the nature of smallpox such as the comments on the increasing virulence of smallpox in the 1660s and 1720s, confirming statistical evidence on the subject. See Creighton, *History*, p. 436; Miller, *Adoption*, p. 30; Razzell, *Conquest*, pp. 169, 176.
[14] Razzell, *Conquest*, pp. 176, 177.
[15] Razzell and Spence, 'History', p. 291, n. 43.
[16] Sköld, *Two faces*, p. 166. The slight shift in age structure may have been due to the practice of inoculation in Sweden, although the exact extent of the practice is unknown. The effect of inoculation on age structure is discussed later in this article.

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

Table 4. *Smallpox mortality age distribution (%), Sweden 1776–1805*

Period	*<1 years*	*1–2 years*	*3–4 years*	*5–9 years*	*10–24 years*	*25+ years*	*Total*
1776–85	25.5%	30.9%	22.9%	14.6%	5.8%	0.3%	100%
1786–95	30.1%	31.8%	18.8%	14.3%	4.7%	0.3%	100%
1796–1805	28.2%	33.2%	19.7%	14.1%	4.4%	0.4%	100%

Source: Sköld, *Two faces*, p. 166.

Table 5. *General inoculations in the south of England, 1778–98*

Place	*Date of general inoculation*	*Nos. inoculated*	*Population size in 1801*
Irthlingborough, Northamptonshire	1778	Above 500	811
Diss, Norfolk	1784	1,100	2,246
Painswick, Gloucestershire	1785	738	3,150
Brighton, Sussex	1786	1,887	3,620 (1785 population)
Brighton, Sussex	1794	2,113	5,669 (1794 population)
Lewes, Sussex	1794	2,890	4,909
Dursley, Gloucestershire	1797	1,475	2,379
Tenterden, Kent	1798	1,167	2,370

Source: Razzell, *Conquest*, p. 189.

this time. Table 4 suggests that smallpox remained at a roughly similar level of infectiousness during the period 1776–1805.

There is piecemeal evidence to suggest that smallpox remained an adult as well as a childhood disease in the late eighteenth century in the south of England. In Horton Kerbie, Kent, there were just eight deaths from smallpox in 1772–1801, and the descriptions of those dying from the disease were as follows: 'a young woman', 'married', 'aged 61', 'aged 54', 'wife', 'aged 61', 'wife', and 'aged 55'.[17] There were only 12 smallpox deaths in the small and isolated parish of Breamore, Hampshire, in the period 1720–1803, and 10 of these were adults.[18] The mean age of the 10 people dying from smallpox in Sutton Courtney, Berkshire, in 1782–1811 was 38 years, compared to the average age of the six measles deaths—six years.[19] Some of this age distribution may have been influenced by the practice of inoculation, but evidence from general inoculations suggest that even at the end of the eighteenth century, a large proportion of vulnerable people in the south of England were adults. Table 5 summarizes numbers inoculated and population size in 1801.

Many of these general inoculations covered a half and more of the total population, and many of them would have been adults. Those inoculated in Brighton in 1786 were described as 'Persons of all ages from one day to Near Fourscore Years old', and those in Dursley in 1797 as 'of all ages, from a fortnight old to seventy years'.[20] Many militiamen and members of the army were inoculated for smallpox in the 1790s, indicating that adults were still vulnerable to the disease. *Woodfall's Register* reported in 1793 that 'many of the Sussex militiamen . . . are under inoculation', and in the following year it was reported that 'there are now 60 of the

[17] Razzell, *Conquest*, pp. xiv, xv.
[18] Ibid., pp. xii, xiv.
[19] Ibid., p. 26.
[20] Barron, 'Gleanings', p. 606; Crookshank, *History*, vol. 2, p. 182.

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

Essex Cavalry under inoculation of the small pox'.[21] Likewise, the surgeon of the North Gloucester Militia vaccinated 'several hundreds of all ages' in 1800, and Jenner vaccinated in the same year the 85th Regiment, and 'scarcely a man was off duty during the whole progress'.[22]

These provincial populations in the south of England were the source of the majority of migrants in London, and the above evidence does not suggest that there was an increase in the infectiousness of smallpox in these London hinterlands. Although adults continued to be vulnerable to smallpox in these rural areas, general inoculations brought about a shift in the age structure of the disease as a result of inoculation, as evidenced by a Mr Wayte, a surgeon who practised at Calne in Wiltshire:

> in September, 1793, when the poor of the parish were inoculated . . . we inoculated six hundred and upwards . . . Besides the poor, I inoculated about two hundred [private] patients . . . Now in inoculating a whole parish, we have no choice of patients, all ages, and the sickly as well as others, were inoculated, but these were mostly children, as I assisted in inoculating the whole parish, about twelve or thirteen years ago.[23]

II

There is plenty of evidence that inoculation was practised very widely in the south of England in the period after 1765.[24] Howlett summed up the general position in 1781 with reference to the extent of inoculation: 'In provincial towns and villages, as soon as this disorder [smallpox] makes its appearance, inoculation takes place amongst all ranks of people; the rich and poor, from either choice or necessity, almost have recourse to it'.[25]

The position in London is much less clear. Previously it was thought that inoculation made little headway in this period,[26] and Davenport et al. conclude that 'inoculation remained unpopular in London in the eighteenth century'.[27] However, this conclusion is based on fragmentary and limited evidence. In order to assess the practice of inoculation in London it is necessary to review in detail its history from the 1760s onwards.

III

Daniel Sutton's family was responsible for the simplification and improvement of inoculation, and played a major role in its success, including its practice in London. According to Woodville:

> In 1767, Mr D. Sutton removed to London, where he hoped to profit by his profession still more than he had done in the country; but his practice fell far short of his

[21] *Woodfall's Register*, 19 June 1793; *St James Chronicle*, 16 Oct. 1794.
[22] *Whitehall Evening Post*, 10 April 1800; *General Evening Post*, 12 June 1800.
[23] Cited in Beddoes, 'Queries', pp. 56–9.
[24] See Razzell, *Conquest*; Smith, *Speckled monster*; Brunton, 'Pox Britannica'; Mercer, *Disease*.
[25] Howlett, *Examination*, p. 94.
[26] Razzell, *Conquest*, p. 96.
[27] Davenport et al., 'Decline', p. 1302.

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

expectations; and the two houses, one at Kensington Gore, and another at Brentford, which were procured for his inoculated patients, were soon abandoned.[28]

Sutton practised inoculation in Kensington for 10 years, charging his wealthy patients 10 guineas for each inoculation—this included board and accommodation—and servants 'and others of that class', five guineas.[29] Sutton's partner, Mr Bond, set up house in 1769 in Pond Street, Hampstead, London, but charged somewhat less—'from three to ten guineas according to the apartments wanted'.[30] Daniel Sutton's brother, William, also practised in London, occupying premises in 1772 in Goodge Street, resulting in a dispute between the brothers about the right to claim the practice of 'Suttonian' inoculation.[31]

Daniel Sutton moved from Kensington to Lisle Street, Leicester Fields, in London, in 1777, advertising that 'Kensington Gore having been found exceeding inconvenient to many desirous of embracing Inoculation, especially the numerous Poor . . . Mr Sutton, as he has ever done, means to adapt his Terms to the Abilities of the Patient'.[32] This shift down-market was probably the result of Sutton's failure to compete effectively with the eminent physician Baron Dimsdale for the custom of the wealthy and fashionable.[33] As a result, Sutton was forced to reduce his prices, reflected in the following account of his new practice: 'The terms of Sutton are so moderate that men in mean circumstances, men of low education and dissolute life, repair to his house, which is so confused and disorderly that one would admire one-tenth part of his patients do not perish by their irregularities'.[34]

Sutton had from an early stage promoted inoculation among the London poor. He advertised in a London newspaper in January 1770 a plan of 'universal Inoculation at the Patient's own Habitations'. The plan was 'principally intended for the benefit of the industrious poor; such as the families of articifers, handicraftsmen, servants, labourers, etc.'. Special inoculation houses were to be set up in various parts of London staffed by surgeons and apothecaries trained in the Suttonian method. Patients would attend with a letter of recommendation from a subscriber, and would then be given preparatory medicines before returning after an appropriate interval to be inoculated.[35]

Daniel's father, Robert Sutton, also practised inoculation in London, arriving in the city in 1783, and joining his son William as a partner. He advertised that he was the 'original improver of the art of inoculation . . . and proposes carrying on . . . [inoculation] in conjunction with his son [William], on the most reasonable terms. The poor will be inoculated gratis, without any recommendation whatsoever'.[36] The Suttons had used this method of attracting business—offering free inoculation of the poor—in exchange for an agreement to inoculate all private patients within a particular parish. It is not known how this operated in

[28] Woodville, *History*, p. 350.
[29] *St James Chronicle*, 9 Feb. 1768.
[30] *Public Advertiser*, 21 April 1769.
[31] Ibid., 20 Oct. 1772.
[32] *Daily Advertiser*, 1 Oct. 1777.
[33] Dimsdale was an influential physician who practised Suttonian inoculation among wealthy families, including that of Catherine the Great, who conferred a barony on Dimsdale as a result of the successful inoculation of her son. See Fox, *Dr John Fothergill*, pp. 79–98.
[34] Abraham, *Lettsom*, p. 195, n. 2.
[35] Brunton, 'Pox Britannica', p. 155.
[36] *Morning Herald*, 6 Feb. 1783.

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

London—perhaps through agreements with parish authorities to inoculate workhouse occupants at a set a fee, and allowing the poor of the parish to be inoculated free.[37] In 1785 Robert and William Sutton placed the following advertisement in a London newspaper:

> Mess. Sutton (Father and Son) of Charlotte Street . . . continue the practice of Inoculation in London, and to the distance of twenty miles around it . . . they have never lost a single patient in fifteen years practice, during which time they have inoculated several thousand persons . . . Their medicines for the small-pox are sold, wholesale and retail, at their house, no. 96 Charlotte Street . . . in Five Shilling packets, with full instructions that will enable parents to inoculate their families without any other assistance. N.B. The poor are inoculated gratis.[38]

The importance of this advertisement is not just the account of the Suttons' practice of inoculation in London, but the way it had become popularized through the sale of medicines and advice enabling family self-inoculation. The sale of medicines both wholesale and retail suggests that inoculation was being practised by non-professionals, which we will see later consisted not only of parents, but other amateur inoculators with a range of different occupations. Competition between amateurs and professionals had driven down the price of inoculation in rural areas, particularly where general inoculations were carried out.[39] Given the more gradual uptake of inoculation in London, it remained a major market, perhaps accounting for Robert Sutton Senior's move to London in 1783.

In 1786, Daniel Sutton advertised in London newspapers that he was practising at a General Inoculation Dispensary, both inoculating patients and giving a series of practical lectures on inoculation.[40] In April 1788 he and his brothers were described as being 'very eminent in the practice', two of whom, including Daniel, were active in London.[41] He claimed in 1796 that there were 'near one hundred thousand instances of inoculation in which I have been immediately employed, or have some concern, in consultation with others'.[42]

Daniel Sutton continued to live and work in London,[43] dying in Hart Street, Bloomsbury Square, in February 1819.[44] In a short obituary in the March issue of the *Gentleman's Magazine* he was credited with having carried out inoculation 'to an immense extent, with extraordinary success at Ingatestone, and subsequently in the Metropolis'.[45] Likewise, an obituary in Gorton's *Biographical Dictionary* stated that Sutton had 'settled first at Ingatestone, Essex, and afterwards in London, where he was very successful'.[46] No exact numbers are available of the number of children that the Suttons inoculated in London, although Lipscomb claimed in

[37] Robert Sutton died in Norfolk in April 1788; *Felix Farley's British Journal*, 26 April 1788.
[38] *Morning Post*, 15 Feb. 1785.
[39] Razzell, *Conquest*, pp. 67–9.
[40] *Morning Herald*, 9 Jan. 1786; *Morning Post* and *Daily Advertiser*, 25 Oct. 1786.
[41] Smith, *Speckled monster*, p. 90.
[42] Sutton, *Inoculator*, p. viii.
[43] See the *Star*, 1 June 1798, where a father describes in detail the successful inoculation by Sutton of his three children. Daniel Sutton placed an advertisement in the *Morning Post* on 17 Feb. 1807, stating that 'Cowpox [Was] No Security Against Small-Pox'. He claimed that he had been able successfully to inoculate patients who had been previously vaccinated, offering to waive his usual fees in cases of failure.
[44] *Gentleman's Magazine*, 89, 1 (1819), p. 281.
[45] Ibid.
[46] Gorton, *Dictionary*, vol. II, p. 975.

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

1806 that the family had in total 'inoculated more than five hundred thousand persons'.[47] The Suttons had been so successful in carrying out inoculation, and their methods had become so influential in the late eighteenth and early nineteenth century, that a Parliamentary Bill in 1808 referred to 'the Suttonian inoculation' in order to distinguish it from 'cowpox inoculation'.[48]

IV

The improvement in inoculation made by Daniel Sutton influenced the practices of the London Smallpox Hospital. The hospital began to inoculate children under seven as out-patients in March 1771, placing the following advertisement in the *Public Advertiser*:

> As no Patient is admitted into the House of the Hospitals for Small-Pox and Inoculation, under the Age of seven Years, and some of the Governors being willing to give the Benefit of Inoculation to those of the Poor, who may desire it, tho' not so old. Notice is hereby given that they may be inoculated by the Physician of the said Hospitals, be under his Care, and have Medicines gratis provided they apply at their House in Cold Bath Fields, or at Pancras, when they will be informed how to proceed.[49]

The hospital appealed for more charitable donations, explaining the reasons for its change of practice, stating that 'the Governors of this Charity being more and more convinced, by daily Experience of its great Utility, from the Disposition which now generally prevails in favour of Inoculation'.[50] According to Squirrell, apothecary to the hospital, 'Dr Archer, who had been physician to that institution for more than twenty years . . . had inoculated about 20,000 patients, besides the great number that he was daily in the habit of inoculating at the hospital, and who were called out-door patients. His private practice . . . also [amounted] to many thousands more . . .'.[51] Archer continued as physician to the hospital until his death in 1789,[52] indicating that an annual average of about 1,100 out-patient inoculations were carried out on children in the period 1771–89.

The rules of the hospital published in 1786 stipulated that '[a] Person under the Age of Seven Years . . . if brought to the Hospital at *Pancras* any Morning before Nine o'clock, will be inoculated and furnished with medicines, as an Out-Patient, subject to the Directions of the Physicians'.[53] By 1796, the age at which children could be inoculated as out-patients had been reduced to five years, suggesting that children aged six to seven were no longer permitted to be inoculated.[54] It appears that 'out-door' patients did not require a recommendation from a governor of the

[47] Lipscomb, *Manual*, p. 30.
[48] Creighton, *History*, p. 495.
[49] *Public Advertiser*, 9 March 1771.
[50] *Public Advertiser*, 12 April 1771. The hospital stated that for an annual donation of five guineas, a person could become a governor recommending 12 or 13 in-patients for inoculation.
[51] Squirrell, *Observations*, p. 23.
[52] http://munksroll.rcplondon.ac.uk/Biography/Details/119 (entry for Edward Archer).
[53] *Rules and orders* (1786), p. 12.
[54] *Rules and orders* (1796), p. 16. Many poor families refused to attend the hospital for check-ups, for, as Moore, *History*, p. 63, stated, 'it is found difficult to induce poor people to attend their surgeon regularly at the hospital'.

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

hospital, and Moore, who was hostile towards inoculation, described how 'all who appeared at the gates of the hospital were promiscuously inoculated with the Small Pox, and suffered to wander abroad'.[55]

The overall numbers of inoculations carried out in the hospital were relatively small—there were a total of 47,471 inoculations between 1746 and 1808.[56] The importance of these cases was not so much the numbers involved, but the knowledge that the London poor acquired the benefits of inoculation through its wide practice on out-patient children.

Adult migrants appear to have made use of the hospital when an epidemic threatened. Willan wrote in 1801: 'Patients admitted into the Inoculation-Hospital . . . are mostly persons from the country, who, alarmed on finding some of the inhabitants of the houses where they lodge, or visit, affected with the Small-pox, endeavour to anticipate the disorder by means of inoculation'.[57] No exact numbers are available for adults inoculated in the hospital in the late eighteenth century, but Willan stated that 514 people were admitted as in-patients in 1797, and most of these were probably adults.[58] A total of 1,300 patients were inoculated at the hospital in that year,[59] nearly double the average of those carried out in 1746–1808 (766). This suggests that there was an acceleration in numbers at the end of the century, but it is doubtful that this could account for more than a small proportion of the decline in adult smallpox mortality at this time. Over 16 per cent of all smallpox deaths were among adults over 20 years of age in St Martin's in the period 1752–66, which fell to about 4 per cent in 1775–99. There were about 21,000 smallpox deaths in London in the first period,[60] and if the proportion were similar to that in St Martin's then 16 per cent of these (3,400) would have been adults. The St Mary Whitechapel proportion was of the order of 10 per cent in this period, indicating the number of smallpox deaths was about 2,100. Case fatality rates among adults in London at this time were probably about 25 per cent,[61] suggesting that the vulnerable adult population was between 8,400 to 13,000 people in any one year. Adult inoculation at the hospital probably covered only between 4 and 6 per cent of this vulnerable population—500 of 8,400 to 13,000 people. However, private inoculation of adults was also probably practised in London, further reducing adult smallpox mortality during this period, although the scale of this contribution to the reduction of smallpox is unknown.

As well as the London Smallpox Hospital and dispensaries to be discussed later, there were a number of other institutions that practised inoculation in the eighteenth century. Davenport et al. have mentioned individual workhouses inoculating their children, and the Marine Society inoculated all the boys recruited by them and placed in both the Royal and Merchant Navies.[62] Likewise, the Foundling Hospital made it a standing rule in 1749 that all children should be inoculated before entry.[63] It was not the absolute numbers of inoculations carried out by these

[55] Moore, *History*, p. 250.
[56] Razzell, *Conquest*, p. 96.
[57] Willan, *Reports*, pp. 174, 318 (quotation).
[58] Ibid., p. 141.
[59] Ibid., p. 141.
[60] Razzell, *Conquest*, p. 198.
[61] Ibid., p. 176.
[62] Razzell, 'Did smallpox reduce height?', p. 358.
[63] Creighton, *History*, p. 514.

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

institutions that were important, but the experience that the ordinary population had of the success of inoculation in preventing attacks of natural smallpox.

The other major medical influence on the practice of inoculation in London was the work of Lettsom and his colleagues. In 1775 they established a London 'society for inoculating the poor in their own homes'.[64] Lettsom described the background to the events leading up to the establishment of the society and its effects as follows:

> to a very useful, and the most numerous part of the [London] community, the advantages resulting from it [inoculation] have hitherto in great measure been lost, either from the confined circumstances of the poor, or from their prejudices against so extraordinary an innovation in practice. At length, however, examples of the dreadful effects of the natural, and the wonderful success of the artificial disease [inoculation], have overcome these ill-founded prejudices, and nothing seemed wanting, to enable the poor to reap the benefit of this practice, but an establishment suited to their condition and circumstances . . . no Institution for that purpose existed here till the year 1775, when the Society for General Inoculation of the Poor was first established . . . The poor, however, though slow in admitting new improvements, and not soon to be reasoned out of self-evident facts, and their willingness to try Inoculation continues to augment with the success of the practice.[65]

This plan was opposed by Dimsdale, on the grounds that 'partial' inoculation of people in their own homes would spread smallpox to vulnerable people.[66] In response to Dimsdale's criticisms, Lettsom and colleagues founded in 1777 a Dispensary for General Inoculation, which provided free inoculation to patients recommended by subscribers. In 1779, Lettsom reported that the Dispensary was 'flourishing', and it was listed in Simmon's *Medical Register* for 1780.[67] Little is known, however, of its long-term success.

Clare, a surgeon living in London, wrote in 1781 that 'Dispensaries for Inoculation are beginning to be provided in this metropolis'.[68] Details of these dispensaries are not available, except for individual advertisements placed in local newspapers. The St Mary-Le-Bone General Dispensary located in Wells Street was founded in 1785, and stated in 1791 that 'a Subscriber of One Guinea annually becomes a Governor, and entitled to one Patient constantly on the Books as well as for Inoculation'.[69] Likewise, the Infant Poor Charity, for Inoculation, and General Dispensary for Relief of the Infant Poor in Wardour Street, Soho, advertised in 1788 that one of its aims was 'to make the advantages of inoculation as general as possible'.[70] The Western Dispensary in Charles Street, Westminster, was established in 1789 'for the Relief of the Sick, Poor, and for Inoculation', and continued in operation until at least 1814.[71]

Watkinson, a medical supporter of inoculation, wrote in 1777 that 'since the year 1755 . . . inoculation, tho' much practised in the country parts of England, made

[64] Lettsom, *Answer*, p. 42.
[65] Lettsom, *Letter*, p. 43.
[66] Razzell, *Conquest*, p. 96.
[67] Brunton, 'Pox Britannica', p. 162.
[68] Clare, *Observations*, p. 55.
[69] *E. Johnson's British Gazette*, 8 May 1791.
[70] *World*, 27 Feb. 1788.
[71] *True Briton*, 29 April 1797; Highmore, *Pietas Londinensis*, p. 303.

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

no progress in the capital'—but went on to add that 'inoculation has become very fashionable' in London during 'the last four years'.[72] However, Black, a physician and an influential advocate of inoculation, writing in 1781, stated that inoculation 'has made very little progress in London', although this statement may have been made because of his frustration with the slow growth of inoculation in London.[73]

Black opposed Dimsdale's arguments by pointing out that 'in great cities no persons can flatter themselves with hopes of escaping the disease . . . and sooner or later [smallpox] is sure to prowl through every street, lane and alley'.[74] More tellingly, Black observed that 'few physicians Inoculated so many at private houses . . . of the rich and gentry . . . in this city [of London], and its neighbourhood, as [Dimsdale] himself'.[75] Black claimed that as a result of these criticisms, Dimsdale issued a further edition of his work, which concluded with a hope 'that Inoculation may become general at private houses in cities'.[76] Black and allies additionally launched a newspaper campaign criticizing Dimsdale,[77] which included letters from 'A Friend to General Inoculation in London', claiming that Dimsdale had sent his newly edited work 'gratis . . . with uncommon profusion amongst the Medical Gentlemen in London'.[78]

Inoculation in the homes of patients was not only practised by Dimsdale, but by other inoculators operating in London. In 1769 the following advertisement appeared in the *Public Advertiser*:

> The Inoculation at Hackney is removed to another Place: such as are desirous of being accommodated, or of being inoculated at their own Houses in either Town or Country, may please apply, as before, in Mare-street, Hackney, or at no. 36 Throgmorton-street, near the Exchange, London.[79]

The controversy between Dimsdale and Lettsom did not result in the practice of general inoculation in London, but it did further encourage inoculators such as Daniel Sutton and others to practise inoculation on patients who were no longer confined to special isolation hospitals. For example, in 1785, three physicians advertised that they would inoculate in Sydenham, Kent, which was on the outskirts of London, promising 'to attend patients at their own houses, either to Inoculate, or in the natural small-pox'.[80]

However, John Franks, a London surgeon, indicated in 1800 that the London poor continued to resist the practice:

> . . . when small-pox is in a house where there are many children and adults liable to the disease, the proposal to inoculate, gratuitously, all those who are not exempt, is too often disregarded by themselves or relations. It is in vain that we expostulate in these situations, and endeavour to convince them of the non-existence of a double infection [that

[72] Watkinson, *Examination*, p. 28.
[73] Black, *Observations*, p. 2.
[74] Ibid., p. 81.
[75] Ibid., pp. 54, 81.
[76] Ibid., app., p. 2.
[77] See, for example, *Lloyd's Evening Post*, 20 and 24 Aug. 1781.
[78] Ibid., 31 Aug. 1781.
[79] *Public Advertizer*, 20 April 1769.
[80] *Morning Herald*, 10 June 1785. For other examples of private inoculations in 1785, see Whately, 'Case of two children', p. 159.

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

> inoculated children would later catch smallpox], or of an accumulation of disease; for the contrary opinion is too firmly impressed to be easily obliterated.[81]

Like Black, Franks was probably overstating his case because of the difficulties in establishing general inoculation in London He contested the notion that inoculation spread smallpox, arguing that:

> the increase of mortality from Small-pox [in London] commenced long before the introduction of inoculation; and, that it continued to increase by a regular progression, until, from the prevalence of the practice, a decrease became observable . . . [it] is at present (*id. est.* more than twenty years ago) considerably declining.[82]

This is parallel to the situation in Whitehaven, Cumberland, where the poor were reported to be opposed to inoculation, yet the practice of inoculation reduced smallpox mortality by about two-thirds in the last two decades of the eighteenth century.[83]

V

Much of the evidence for inoculation in London is from indirect sources. In a letter written by Dr C. Dennet in support of vaccination in early 1803, he revealed his own practice of inoculation in London at an earlier period:

> . . . great success . . . attended a very extensive inoculation for the Small-Pox, having inoculated, and seen treated by my father, between six and seven thousand patients . . . [and] those parents who had witnessed the mildness of the disease under my particular treatment, would not permit me to use the Vaccine . . . I vaccinated my last child, and strenuously endeavoured to persuade every parent to have used it, but cannot always prevail.[84]

Similar types of evidence are to be found in the writings of Jenner and his supporters, frustrated by the opposition to vaccination. According to a report in the *Gentleman's Magazine* in 1803, 'Mr Wilberforce observed on the popular prejudice, that out of 100 who had been vaccinated at the Smallpox Hospital, not five would have submitted, had they not supposed it to have been the old-fashioned mode of inoculation'.[85] In fact some of the opposition to vaccination was fuelled by the realization as early as 1800 that it gave a more limited protection against future attacks of smallpox than the old inoculation.[86] In October 1805, a correspondent wrote from London to an Edinburgh journal: 'The many late failures of supposed cowpock to prevent the smallpox have excited in some parts so much clamour among the lower orders of people that they insist upon being inoculated for the smallpox at some of the public institutions'.[87] As a result of this clamour, the London Smallpox Hospital, which had abandoned the inoculation of out-patients, was forced to reinstate it in 1805, before banning it again in 1808.[88]

[81] Franks, 'Letter from John Franks', p. 519.
[82] 'Mr Franks on variolous contagion', pp. 84, 149.
[83] Razzell, *Conquest*, p. xxi.
[84] Dennett, 'Letter from Dr C. Dennett', p. 363.
[85] *Gentleman's Magazine*, 58, ii (1803), p. 71.
[86] 'Letter from physicians and surgeons', p. 187; *Gentleman's Magazine*, 58, ii (1803), p. 71.
[87] Creighton, *History*, p. 589.
[88] Abraham, *Lettsom*, p. 355; Gregory, *Some account*, p. 10.

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

The popularity of inoculation and hostility towards vaccination were reflected in the number of the two different operations carried out in the hospital: 'At the . . . Hospital the number of vaccinations declined after 1805 from two thousand to sixteen hundred, while inoculations doubled from two to over four thousand five hundred. However, the trend was short-lived. By 1808, vaccination and inoculation were again equally popular'.[89]

In a letter to Lettsom, dated July 1807, Jenner wrote: 'You will be sorry to hear the result of my interview with the Minister, Mr Perceval. I solicited . . . whether it was the intention of government to give check to the licentious manner in which small-pox inoculation is at this time conducted in the metropolis . . . [associated with] the capricious and prejudices of the misguided poor'.[90] Murray, a London physician, pointed out in 1808 that these inoculations were carried out 'in every street, court and alley, in the metropolis'.[91]

The continuing popularity of inoculation in London is revealed by the reports of the Vaccine Establishment in the 1810s. The Board of the Establishment was made up of members of the medical profession who were supporters of Jenner. In the conflict between vaccination and inoculation, the supporters of the former used the continuation of smallpox in London as a basis for attack against inoculation, arguing that the latter was spreading the disease through secondary contagion. This was irrelevant in London, where smallpox affected most native-born Londoners in childhood. In 1811 the report of the Vaccine Establishment concluded:

> The Board are persuaded that the [smallpox] mortality [in 1810] has arisen from contagion having been propagated by inoculation persons, of the poorer classes, whose prejudices against Vaccination are kept alive by false and mischievous hand bills, denouncing various imaginary and feigned diseases against all those who have undergone Vaccination: and the Board has reason to believe, that these bills are issued by persons, in several parts of London, who desire emolument from small pox inoculation.[92]

Likewise in the following year, the Board claimed that 'the increase [in smallpox mortality] we . . . ascribe to the rash and inconsistent manner in which great numbers are still inoculated for the smallpox, and afterwards required to attend two or three times a week, at the place of Inoculation'.[93] This procedure suggests that the plan drawn up by Sutton was still in operation, and continued to influence the medical practice of inoculation in London.

VI

The cost of inoculation inhibited its uptake among the poor,[94] and there were radical changes in its practice which enabled it to become widely available. To understand these it is necessary briefly to explore the history of amateur inoculation in England. It was practised by amateurs in Scotland and Wales even before

[89] Brunton, 'Pox Britannica', p. 202.
[90] Baron, *Life*, pp. 69, 70.
[91] Murray, *Answer*, p. 3.
[92] *Report from the Vaccine Establishment* (1811), p. 2.
[93] *Report from the Vaccine Establishment* (1812), p. 1.
[94] Cooper, *Vaccination*, p. 51.

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

it was introduced by the medical profession in 1721.[95] Amateur inoculation was also practised in Devon by itinerant inoculators in the early 1760s,[96] but there appears to have been an upsurge after the innovations introduced by Daniel Sutton. According to the resident surgeon of the Foundling Hospital in London in 1768, 'very great success has likewise attended inoculation in many parts of this kingdom: even though it has of late descended into very illiterate hands (a livery servant, belonging to a friend of the author's left his master's service, not a great while since, to practice inoculation)'.[97]

In a somewhat humorous letter written on 4 March 1768 to the *Chelmsford and Colchester Chronicle*, it was stated that:

> All the villages in our neighbourhood [in Northamptonshire] are at present under inoculation. We have a great variety of practitioners, from the pompous Tye-Wigg down to the greasy night Cap; even boys of seven or eight years perform the operation for a halfpenny a-piece, and succeed surprisingly . . . Giles Wilcox, the sowgelder, who lives near the pinfold, is by far the most in vogue. What the method is I cannot learn, but 'tis said to be preferable to the Suttonian or any other wholesale operator we have yet seen.[98]

William Buchan in the 1769 edition of his *Domestic medicine* recommended that 'should all other methods fail, we would recommend it to parents to perform the operation [of inoculation] themselves . . . I have known many instances even of mothers performing the operation'.[99]

Dimsdale in 1776 acknowledged the successful role of non-professional inoculators, stating that 'many instances can be produced, where whole parishes of poor have been inoculated, and have succeeded very well, under the care of persons who were totally unacquainted with medicine'.[100] In 1782, an anonymous author published a letter in which he stated that 'I have known many instances of mothers performing the operation, and never heard of one bad consequence . . . Common mechanics have often, to my knowledge, performed the operation, with as good success as physicians'.[101] Clare, the surgeon, published a similar letter in the same year justifying parental inoculation, claiming that unlike the inoculation practised by Dimsdale and other medical professionals, 'preparation is unnecessary, and that it has frequently proved detrimental'.[102] Buchan in the 1797 edition of his *Domestic medicine* concluded that 'of late many [mothers] . . . have performed this operation [of inoculation] with their own hands; and as their success has been equal to that of the most dignified inoculators, there is little reason to doubt that the practice will become general'.[103]

Inoculation continued to be practised by amateurs well into the nineteenth century, by farmers, knife-grinders, fishmongers, whitesmiths, blacksmiths,

[95] Razzell, *Conquest*, pp. 7, 8. One account described how itinerant gypsies travelled Wales carrying the smallpox matter 'in a Quill, and scratched the Arm with a Pin or Needle', anticipating modern techniques of vaccination. See *St James's Chronicle*, 18 Sept. 1781.
[96] Razzell, *Conquest*, p. 69.
[97] Watson, *Account*, pp. 71, 72.
[98] *Chelmsford and Colchester Chronicle*, 4 March 1768.
[99] Buchan, *Domestic medicine*, p. 267.
[100] Dimsdale, *Thoughts*, pp. 63–4.
[101] *Parker's General Advertiser*, 2 July 1782.
[102] Ibid., 19 Sept. 1782.
[103] Buchan, *Domestic medicine*, p. xvii.

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

paupers, nurses, farriers, publicans, tailors, shoemakers, and parents.[104] The medical profession was usually scathing of these amateur operators, but the latter were largely responsible for simplifying the operation to a format very similar to vaccination,[105] achieving very successful results.[106] Physicians and medical practitioners insisted on long periods of preparation, which included bleeding, purging, and the use of a special diet, as well as expensive aftercare, whereas amateur inoculators dispensed with these unnecessary extras.[107] The practices of the medical profession were in fact dangerous, not only through the risk of secondary infection through the bleeding of patients, but also exposing those inoculated to the risk of natural smallpox during the period of preparation.

In 1818 the report of the Vaccine Institute included the following account of the activities of amateur inoculators in London:

> The pernicious practice of Small Pox Inoculation . . . is now performed for gain, by itinerant Empirics, Farriers, Publicans, Nurses, low cunning people of both sexes, and of various descriptions. And such is the infatuation of the poor and ignorant, that many of them carry their infants to be inoculated by those [carrying out this practice] . . . this iniquitous conduct prevails much in London . . . Complaints of the same injurious practices have been sent to the Board from various parts of England . . .[108]

Itinerant inoculators probably played a major role in providing inoculation in London, which represented a significant market for their operations, and their practice grew from the date of the Suttonian innovations in the 1760s.[109] There is also evidence that the London Smallpox Hospital played a part in the amateur practice of inoculation, not only through the provision of out-patient inoculation, but also the supply of smallpox virus to non-professionals. In 1808, the hospital's committee 'received a communication from their president . . . recommending them to rescind the practice of the delivery of lancets, charged with variolous matter, indiscriminately, and an ensuing court [of the hospital] restricted this practice to physicians and surgeons'.[110] This seems to have been associated with the provision of inoculation to out-patients, for the hospital's committee noted 'that of all cases which applied, the medical officers succeeded with fifty only in recommending vaccination; and more than two hundred others refused to listen to any explanation or argument; and declared, that if their children were not inoculated with smallpox, they should take their chance'.[111]

This use of inoculation by the ordinary population appears to have threatened the medical profession, resulting at times in almost a state of class war. In a letter to James Moore on 26 February 1810, Jenner wrote referring to the year 1807 that 'John Gale Jones . . . had once the impudence to desire a man to call on me in Bedford Place to say, that he, Jones, would advise me immediately to quit London,

[104] Dimsdale, *Thoughts*, pp. 62, 63; Cross, *History*, pp. 13, 269, 272; Forbes, 'Some account', pp. 213, 219, 220; Carter, 'General report', p. 268.
[105] See, for example, Sinclair, *Statistical account*, pp. 569–71.
[106] Dimsdale, *Thoughts*, p. 63; Razzell, *Conquest*, pp. 35, 107, 108.
[107] Razzell, *Conquest*, pp. 35, 36.
[108] *Report from the Vaccine Establishment* (1818), p. 3.
[109] Razzell, *Conquest*, pp. 68–70.
[110] Highmore, *Pietas Londinensis*, p. 303.
[111] Ibid., p. 303.

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

for there was no knowing what an enraged population might do'.[112] Gale Jones was a surgeon and apothecary, who was a political radical—he had been a leading member of the London Corresponding Society[113]—and his threat to Jenner suggests that the differences between the supporters of vaccination and inoculation had become associated with the class hostilities that emerged at the beginning of the nineteenth century.[114]

Jenner's biographer, John Baron, confirmed this in 1822: 'In consequence of the adoption of vaccination by most respectable medical men, many of the lower classes took up the small-pox lancet'.[115] In fact, as we saw from Wilberforce's comment on the support in London for the old inoculation, the potential for opposition to vaccination existed before its advent at the beginning of the nineteenth century. In 1812 the Vaccine Establishment lamented that the take-up of vaccination in London lagged badly behind its practice in other towns and cities, particularly abroad, a conclusion confirmed by Baron in his biography of Jenner.[116]

The physician to the Smallpox Hospital, Dr George Gregory, in discussing in 1830 the pattern of smallpox in London during the eighteenth century, summarized the practice of inoculation in the late eighteenth century: 'the Small Pox Hospital was established [in 1746] . . . From that date, Inoculation for the Small Pox began to be generally adopted by all classes of persons throughout England, and the success of the practice at this Hospital was very instrumental in promoting the measure'.[117]

VII

There is no direct evidence of the impact of inoculation on smallpox in London, and there are no reliable statistical data on the extent of the practice of inoculation. Evidence from the London Bills of Mortality is not wholly reliable, but it gives an indication of the long-term pattern of mortality.[118] Davenport et al. have calculated mortality rates from their parish sources and the Bills of Mortality, but these are mainly based on the number of smallpox deaths as a proportion of the total number of all-cause burials. As smallpox was mainly a disease of very young children, it is more appropriate to express the number of smallpox deaths as a proportion of the number of baptisms. The trend of this latter ratio in St Martin's depicted in figure 4a of 'The decline of adult smallpox' is very different from that found in the whole of London according to the Bills of Mortality.[119]

According to table 6, mortality in London as a whole began to fall in the 1770s, halving between 1760 and 1809. Some of this fall in mortality was due to the gradual elimination of adult smallpox, but the latter probably only accounted for

[112] Jenner, cited in Baron, *Life*, pp. 367, 368.
[113] *Morning Chronicle*, 1 July 1799; 22 Feb. 1810.
[114] See Thompson, *Making*.
[115] Baron, *Life*, p. 193.
[116] *Report from the Vaccine Establishment* (1812), p. 3; Baron, *Life*, p. 10.
[117] Gregory, *Some account*, pp. 6, 7.
[118] See P. Razzell, 'Infant mortality in London, 1550–1850: a methodological study', unpub. paper.
[119] Razzell, *Conquest*, p. 198. Davenport et al. have also highlighted the introduction of vaccination at the beginning of the 1800s, but from evidence reviewed in this article inoculation was probably more prevalent in London than vaccination in the following decade.

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

Table 6. *Smallpox mortality in London, 1740–1809*

Period	*Smallpox burials per 100 baptisms*
1740–9	13.7%
1750–9	13.3%
1760–9	13.8%
1770–9	12.1%
1780–9	9.6%
1790–9	8.9%
1800–9	6.9%

Source: Razzell, *Conquest*, p. 198.

Table 7. *Smallpox mortality in St Mary Whitechapel, 1760–1812*

Period	*No. of smallpox deaths under 10*	*No. of baptisms*	*Child mortality rate from smallpox per 1,000 baptisms*
1760–9	803	7,401	108
1770–9	492	7,977	62
1780–9	517	7,724	67
1790–9	462	7,915	58
1800–9	448	7,267	62
1810–12	116	2,235	52

Source: LMA, St Mary Whitechapel parish registers, P93/MRY1/062-64.

about a fifth of the total reduction.[120] The Whitechapel data (table 7) allow us to express child smallpox deaths as a proportion of baptisms, which is perhaps a more accurate measure of changing smallpox mortality, although for a much more limited sample.[121]

The fall in child smallpox mortality was much less linear in Whitechapel than in London as a whole, and this is probably the result of sample size and the characteristics of an individual parish. Nevertheless, child mortality halved in Whitechapel between 1760 and 1812, similar to the reduction depicted for the whole of London in table 6. The reduction in mortality occurred at a time when smallpox was becoming more virulent, with case fatality rates at the London Smallpox Hospital increasing from 26 per cent in 1746–63 to 38 per cent in 1836–51.[122] The fall in mortality in 1760–1812 coincides with the increasing practice of inoculation, including the decade of 1800–9 when inoculation was probably more popular in London than vaccination.

[120] The fall in adult mortality according to the St Martin's and St Mary Whitechapel data was about 10% of all smallpox deaths, whereas the reduction of overall smallpox mortality in tab. 4 was approximately 50% between 1760 and 1809.

[121] All parish register data are subject to a degree of uncertainty because of the under-registration of births and deaths. New research using a number of different methods of measuring parish register reliability in London suggests that about a quarter of all births and deaths were unregistered in the eighteenth century, although this varied significantly from parish to parish, probably as a result of clerical negligence. See Razzell and Spence, 'History', pp. 279–82, and Razzell, 'Infant mortality'.

[122] Razzell and Spence, 'History', p. 176. This was a part of a long-term increase in virulence, with under 4% of children dying from smallpox in London in the sixteenth century, increasing to over 45% among unprotected London children in the 1880s. See Razzell, *Conquest*, pp. 168, 169; Forbes, *Chronicle*; Hovenden, ed., *Register*.

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

The increasing use of inoculation explains the age shift of smallpox deaths in London at the end of the eighteenth century. Both inoculation and vaccination were neglected until the threat of an epidemic, described by the Royal College of Physicians as follows: 'Unless . . . from the immediate dread of epidemic Smallpox, neither Vaccination nor Inoculation appear to have been general, and when the cause of the terror has passed by, the Public have relapsed again into a state of indifference and apathy, and the salutary practice has come to a stand'.[123] Davenport et al. have pointed out that epidemics of smallpox peaked 'every two to three years' in London during the late eighteenth century, although smallpox was present in every year in the city during this period.[124] It would be during these peak periods that inoculation was mainly carried out, concentrating on the young children not previously infected. General inoculations shifted the age incidence of smallpox from adults to children in rural areas, and it is likely that inoculation accounts for changes in the age of children dying from the disease in London. As we have seen, there is uncertainty about the exact change in the ages of children dying from smallpox, but the practice of inoculation would account for the increasing concentration of the disease among children aged five and under.

VIII

Davenport et al. have established a significant new finding on the history of smallpox, stimulating scholarship and requiring novel thinking in order to explain the decline of adult smallpox in London. On the balance of evidence, it appears that there was no increase in the infectiousness of smallpox, but that there was a growth in the practice of inoculation in London during the latter half of the eighteenth and the beginning of the nineteenth century. The spread of the practice probably occurred gradually in London between 1760 and 1812, which is consistent with the changing age patterns of the disease in Whitechapel and the overall decline of childhood smallpox mortality in the same period. The evidence also suggests that there was widespread resort to general inoculations in the provincial areas of southern England, which were the main reservoirs of adult smallpox in London. The elimination of smallpox from these areas and the gradual reduction of childhood smallpox resulting from the practice of inoculation are the most plausible explanations for the changing age patterns of smallpox mortality in London.

There is a parallel between the development of medical and industrial technologies during this period. Most of the improvements in inoculation were made by 'empirics', such as Daniel Sutton and the various amateur inoculators who simplified and improved techniques of inoculation.[125] Likewise, many of the improvements in industrial technology were made by men without academic qualifications, such as Arkwright, Hargreaves, and Trevithick.[126] All these innovators were practical men relying on empirical observation to increase the profitability of their operations in a growing capitalist economy. Physicians and surgeons

[123] *Report of the Royal College of Physicians*, p. 7; see also Razzell, *Conquest*, p. 73.
[124] Davenport et al., *Decline*, p. 1290.
[125] There is evidence that early vaccination was a form of attenuated smallpox identical to a radically simplified form of inoculation; Razzell, *Edward Jenner*.
[126] Weightman, *Industrial revolutionaries*.

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

were often hampered by their theoretical notions which were not empirically based, but provided them with a monopoly of classical knowledge, enhancing their prosperity until challenged by the Suttons and other 'empirics'.

These conclusions will have to be assessed through future research, but Davenport et al. have provided evidence for a major change in disease incidence and medical practice. The elimination of smallpox is one element in a process of change, forming part of the relationship between medical, demographic, and economic development in the eighteenth century, transforming English society in its economic, social, and political structure.[127]

Date submitted *8 December 2010*
Revised version submitted *27 January 2011*
Accepted *29 March 2011*

DOI: 10.1111/j.1468-0289.2011.00620.x

[127] Razzell, *Population and disease.*

Footnote references

Abraham, J. J., *Lettsom: his life, times, friends and descendants* (1933).
Baron, J., *Life of Edward Jenner*, vol. 2 (1838).
Barron, W. A., 'Gleanings from Sussex archives: Brighton and the smallpox', *Sussex County Magazine*, 26 (1952), pp. 605–6.
Beddoes, T., 'Queries respecting a safer method of performing inoculation', in D. A. de Gimbernat, *A new method for the general hernia* (1795), pp. 56–9.
Black, W., *Observations medical and political on the small pox and inoculation* (1781).
Brunton, D. C., 'Pox Britannica: smallpox inoculation in Great Britain, 1721–1830' (unpub. Ph.D. thesis, Univ. of Pennsylvania, 1990).
Buchan, W., *Domestic medicine: or a treatise on the prevention and cure of diseases by regimen and simple medicines* (1769).
Carter, H. W., 'General report of medical diseases treated at the Kent and Canterbury Hospital, 1824', *London Medical Repository*, 18 (1822), pp. 267–9.
Clare, P., *Observations on the nature of treatment of the variolous abscess, with remarks on the modern practice of inoculation, and a review of the principal writers on that important subject . . . In a letter to Dr Buchan* (1781).
Cooper, J., *Vaccinated vindicated, or an Address to the people of England, upon the important subject of vaccine inoculation, with remarks on the necessity, in its behalf, of legislative and clerical interference* (1811).
Creighton, C., *A history of epidemics in Britain*, II, *From the extinction of the plague to the present time* (Cambridge, 1965).
Crookshank, E. M., *History and pathology of vaccination*, vol. 2 (1889).
Cross, J., *A history of the variolous epidemic which occurred in Norwich* (1820).
Davenport, R., Schwarz, L., and Boulton, J., 'The decline of adult smallpox in eighteenth-century London', *Economic History Review*, 64 (2011), pp. 1289–314.
Dennett, C., 'Letter from Dr C. Dennett, Soho Square, January 22', *Medical and Physical Journal*, 5 (1800), pp. 363–4.
Dimsdale, T., *Thoughts on general and partial inoculations* (1776).
Forbes, J., 'Some account of the small-pox lately prevalent in Chichester and its vicinity', *London Medical Repository*, 18 (1822), pp. 208–20.
Forbes, T. R., *Chronicle from Aldgate* (New Haven, Conn. 1971).
Fox, R. H., *Dr John Fothergill and his friends: chapters in eighteenth century life* (1919).
Franks, J., 'Letter from John Franks, Smith Street, Westminster, November 7, 1800', *Medical and Physical Journal*, IV (1800), pp. 518–21.
Gorton, J., *A general biographical dictionary*, vol. 2 (1828).
Gregory, G., *Some account of the hospital for small pox & vaccination, at Battle Bridge, St Pancras* (1830).
Highmore, A., *Pietas Londinensis: the history, design, and present state of the various public charities in and near London* (1814).
Hovenden, R., ed., *The register of christenings, marriages and burials of the parish of Allhallow London Wall, 1559–1675* (1878).
Howlett, J., *An examination of Dr Price's essay on the population of England and Wales* (Maidstone, 1781).

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

'Letter from physicians and surgeons', *Medical and Physical Journal*, 4 (1800), p. 187.
Lettsom, J. C., *A letter to Sir Robert Baker and George Stacpole Esq. upon general inoculation* (1778).
Lettsom, J. C., *An answer to Baron Dimsdale's review of Dr Lettsom's Observations* (1779).
Lipscomb, G., *A manual of inoculation* (1806).
Mercer, A., *Disease, mortality and population in transition* (Leicester, 1990).
Miller, G., *The adoption of inoculation for smallpox in England and France* (Philadelphia, Pa., 1957).
Moore, J., *The history of the smallpox* (1815). http://munksroll.rcplondon.ac.uk/Biography/Details/119 (entry for Edward Archer, accessed 29 Jan. 2011).
'Mr Franks on variolous contagion', *Medical and Physical Journal*, 5 (1801), pp. 81–6.
Murray, C., *An answer to Mr Highmore's objections to the bill before Parliament to prevent the spreading of the infection of the small-pox* (1808).
Razzell, P., *Edward Jenner's cowpox vaccine: the history of a medical myth* (Firle, 1977).
Razzell, P., 'Did smallpox reduce height?', *Economic History Review*, LI (1998), pp. 351–9.
Razzell, P., *The conquest of smallpox: the impact of inoculation on smallpox mortality in eighteenth century Britain* (2003).
Razzell, P., *Population and disease: transforming English society, 1550–1850* (2007).
Razzell, P., 'Infant mortality in London, 1550–1850: a methodological study', submitted to *Local Population Studies*.
Razzell, P. and Spence, C., 'The history of infant, child and adult mortality in London, 1550–1850', *London Journal*, 32 (2007), pp. 271–92.
Report from the Vaccine Establishment (1811).
Report from the Vaccine Establishment (1812).
Report from the Vaccine Establishment (1818).
Report of the Royal College of Physicians of London on vaccination (1807).
Rules and orders of the hospitals for the small-pox and inoculation (1786).
Rules and orders of the hospitals for the small-pox and inoculation (1796).
Sinclair, J. *The statistical account of Scotland: drawn up from the communications of the ministers of the different parishes*, vol. II (1792).
Sköld, P., *The two faces of smallpox: a disease and its prevention in eighteenth and nineteenth-century Sweden* (Umeå, 1996).
Smith, J. R., *The speckled monster* (Chelmsford, 1987).
Squirrell, R., *Observations addressed to the public in general on the cow-pox* (1805).
Sutton, D., *The inoculator; or, Suttonian system of inoculation* (1796).
Thompson, E. P., *The making of the English working class* (1963).
Watkinson, J., *An examination of a charge brought against inoculation* (1777).
Watson, W., *An account of a series of experiments instituted with a view of ascertaining the most successful method of inoculating the smallpox* (1768).
Weightman, G., *The industrial revolutionaries: the making of the modern world, 1776–1914* (2007).
Whately, T., 'The case of two children who received the smallpox by inoculation', *Memoirs of the Medical Society of London*, 5 (1799), pp. 159–64.
Willan, R., *Reports on the diseases in London, particularly during the years 1796, 97, 98, 99, and 1800* (1801).
Woodville, W., *The history of inoculation of the smallpox in Great Britain* (1796).

© Economic History Society 2011

This content downloaded from
146.227.239.33 on Wed, 27 Nov 2024 14:53:21 UTC
All use subject to https://about.jstor.org/terms

Chapter 8: Socio-Economic Status and Adult Mortality in England: a Historical Study, 1881-1891.[1]

Introduction

Currently, and throughout the twentieth century, there is clear evidence of a social gradient in adult mortality, in England and elsewhere.[2] The Registrar-General of England and Wales published figures for adult mortality ratios for men by occupationally defined social class for the period 1910-1953, which showed a social class gradient amongst men in 1910-12, with particularly large differences between Social Classes I and V. This persisted throughout the first half of the twentieth century, although it had diminished somewhat by 1949-53.[3] Inequalities widened again after 1970, and appear to have worsened even further in the 1990s, contributing to the current major concern over the health effects of social inequality.[4] Although there are various methodological debates about these trends, it seems clear from these reports of the Registrar General, and other sources, that a social gradient in mortality was a feature of twentieth century England.

Evidence for the nineteenth century is, however, less clear. Many contemporary commentators linked poverty with poor health and higher mortality amongst adults. However, much of the data for this conclusion was based on death registers which did not take account of the population at risk, a flaw first pointed out by Farr in his discussion of life tables.[5] This critique is particularly relevant to the work of Chadwick, who used information from death registers on occupation and age at death to estimate mortality ratios, without allowing for the population at risk.[6]

Chadwick's work influenced a number of influential contemporary thinkers, including Engels and Mayhew.[7] Early reports from the Registrar-General which indicate occupational and social class differences in adult mortality during the nineteenth century,[8] also suffered from various difficulties. These include possible numerator-denominator bias as the population at risk is calculated from census information and the number of deaths from civil registration returns (a weakness also of twentieth century estimates), which use different methods of classification of data. Descriptions of occupations are also often ambiguous and difficult to classify, with heterogeneous variations within occupational categories, often locally based. Additionally, analyses of national data does not allow for the role of geographical place, which often had a significant influence on mortality.[9]

For example, clergymen and agricultural labourers both had low adult mortality rates in the late nineteenth and early twentieth century,[10] probably due to their residence in rural areas. Available data also does not cover all occupations, so that labourers – who were

---

[1] Unpublished paper, written jointly with Emily Grundy.

[2] G. Davey Smith, D. Dorling, M. Shaw, *Poverty, Inequality and Health in Britain*, 2001; General Register Office, *Fifth Registrar-General's Annual Report, 1841,* pp. xxviii-xxxi; R.G. Wilkinson, K. Pickett, *The Spirit Level: Why Equality is Better for Everyone*, 2010; E. Chadwick, *Report on the Sanitary Condition of the Labouring Population of Great Britain*, 1965.

[3] J. Parker, C. Rollett, K. Jones in A.H. Halsey (ed.) *Trends in British Society since 1900*, 1971.

[4] Davey-Smith, *Poverty*; Wilkinson, *The Spirit Level.*

[5] General Register Office, *Fifth Registrar-General's Annual Report, 1841,* pp. xxviii-xxxi

[6] Chadwick, *Report.*

[7] P. Razzell, *Population and Disease: Transforming English Society, 1550-1850*, 2007.

[8] R. Woods, *The Demography of Victorian England and Wales*, 2000.

[9] E. Garrett, A. Reid, K. Schurer, S. Szreter, *Changing Family Size in England and Wales: Place, Class and Demography, 1891-1911,* 2001.

[10] Woods, *The Demography*; *Supplement to the Registrar-General's Seventy-Fifth Annual report, Part IV: Mortality of Men in Certain Occupations in the Three Years 1910, 1911 and 1912.*

one of the most numerous and poorest occupational groups – are excluded from some analyses.[7]

Farr's own investigation of mortality rates in London indicated no significant difference in mortality between wealthy and poor areas of London in 1838-44.[11] Neison also concluded from Insurance Company and Friendly Society records that there was no link between poverty and adult mortality.[12] However, the latter is subject to the problem of selection as results are based on those who chose, and could afford, to join and remain in Friendly Societies.

One way of partly dealing with these problems is to trace individuals directly through census, civil death register and other source material so avoiding numerator-denominator bias. Additionally, census data provide information on indicators of socio-economic status other than occupation and allow geographical factors to be taken into account. The potential of linked census and registration data has been explored to some extent in two previous small scale studies. In a study of forty-seven Bedfordshire parishes in the 1840s, tracking married couples between the 1841 and 1851 Censuses, results indicated that there was slightly higher mortality amongst professionals, merchants and gentleman than amongst labourers.[13] A similar methodology was employed in research on Ipswich in the 1870s, which suggested that adult mortality was higher in Social Classes I and II than in IV and V, although by the 1890s the position had been slightly reversed.[14]

In the study reported here we have extended this method and applied it to a national sample of married people enumerated in the 1881 Census. The methodological aim of the paper was to investigate tracing rates between census and other sources, principally registration of deaths, and the extent to which using census derived information on transitions from being married to being widowed can be used to extend identification of deaths. The substantive aim was to investigate the extent of social inequalities in adult mortality in late nineteenth century England.

Methods: Data.

We compared the mortality of two contrasting groups: 'elite' couples, defined as those with two or more domestic servants, and poor couples defined on the basis of husband's occupation as a labourer. The link between family income and the number of domestic servants has been widely documented for the period 1825-1906.[15] In general terms, the wealthier the family the greater the number and types of servant they employed, although this association is not perfectly linear.[16] The occupations of head of households in two-servant+ families identified in the current research are heavily concentrated in professional, business and landed families, although also including a number of farmers. Eight married couples were chosen from each county of England, four from each rural parish and four from each county town. We selected the first couple in the 1881 Census enumeration list with two or more domestic servants – designated as elite couples – and then the next family

[11] Razzell, *Population*, p. 136.
[12] Ibid, p. 220-23.
[13] Ibid, p. 201-02.
[14] Ibid, p. 204.
[15] B.S. Rowntree, *Poverty: a Study of Town Life*, 1901; J.A. Banks *Prosperity and Parenthood: a Study of Family Planning among the Victorian Middle Classes*, 1954; J. Burnett, *Plenty and Want*, 1968; P. Horn *The Rise and Fall of the Victorian Servant*, 1974; L. Schwartz, 'English servants and their employers during the eighteenth and nineteenth centuries', *Economic History Review*, 1999 Volume 52.
[16] E. Higgs, 'Domestic servants and households in Victorian England', *Social History*, Volume 8, 1983.

headed by a labourer, known to be one of the poorest occupational groups in England at the end of the nineteenth century.[17] This method of selection was repeated four times for each parish in the sample resulting in 156 elite and 156 labourer couples – and was adopted in order to compare well-defined groups with significantly different socio-economic profiles but the same geographic location.

Sample members were then traced in the 1891 Census, as well as in the civil register index of deaths. The methodology used involved triangulation between census, civil register, and probate sources. Tracing in the census was undertaken to identify those still alive (present in the census) and those whose death could be inferred by the fact that their spouse was present in 1891 but identified as widowed. Two family history sites were employed for this purpose. A first search was made using *Find My Past* and a second using *Ancestry*. It was necessary to use two sites because of the variable accuracy of the transcripts on which the family history indexes are based; variations in the spelling and presentation of birth places; inaccuracies in age reporting. Eighty-nine per cent of cases were traced through the *Find My Past* website, and a further eleven per cent in *Ancestry*.

In summary the following steps were carried out:

1. A search was made for the 1881 sample in the *Find My Past* 1891 census online index.
2. For unidentified cases, a further tracing exercise was carried out on the *Ancestry* 1891 census index.
3. A search was then carried out in the civil registration death index.

The civil registration death index contains information on the name of the individual, his or her age, the registration district in which the death was registered, and the quarter/ year of death. There is no information on kinship connections, occupation or other details which would facilitate identification and allow classification by socio-economic status.

Probate calendars usually provide information on place of death, address, exact date of death and kinship relationships but are only available for a proportion of the population with wealth to bequeath. These calendars have been digitized and indexed by the *Ancestry* family history site for the period 1861-1941, and this data was used to check assumptions about the identification of deaths. In order to trace husband and wives between censuses the following key information is available in the censuses: 1. Name. 2. Age. 3. Birthplace. 4. Registration District. 5. Occupation. 6. Name, birthplace and age of children. Some of this information is also available in the death indexes – name, age and registration district of death.

There are a number of problems in linking census data for individuals, including the variable accuracy of the transcripts on which the family history indexes are based and the remarriage after widowhood especially for women changing their surname on remarriage. In cross-matching census data, a correct identification was assumed to take place when name, birthplace and age to within plus or minus five years were found to be the same. Other identifying information – such as spouse's and children's names, ages and birthplaces, plus occupational information – was also used where necessary. The research employed manual matching which inevitably employs an element of judgment, although the range of identifying information available is sufficiently great to minimize the impact of observer variation (and would suggest potential for computerised matching).

The major problem in the research however is the relative paucity of identifying information in the death indexes. If a person dies outside the registration district in which they were enumerated, it is very difficult to establish a reliable match from census to death index. It was therefore necessary to make recording of death in a previously identified enumeration district of residence a criteria for judging a link between a census and a death

[17] Rowntree, *Poverty*; Burnett, *Plenty.*

record (this was not a criteria in the census matching because of the wider range of information available in the census). Other matching criteria used were name and age.

Results

Table 1: Information on Tracing of Sample Couples in the 1891 Census.

Tracing in 1891 Census	Elite Couples	Labourer Couples	All Couples
Husband & Wife Both Traced	64.1%	65.4%	64.7%
Husband Traced As A Widower	8.3%	6.4%	8.0%
Wife Traced As A Widow	13.5%	8.3%	10.9%
Neither Traced	14.1%	16.0%	15.1%
Total Number Of Couples	156	156	312

Overall, it was possible to trace 84.9 per cent of all 1881 sample couples in the 1891 census through identification of one or both spouses. The remainder will include couples both of whom died or emigrated and transcription errors and variations in the presentation of matching information. Of 233 elite husbands and wives traced alive in the 1891 Census, 71 – 30.5 per cent – were located in a different registration district, whereas the equivalent figure for labourers' husbands and wives was 43 out of 237 – 18.1 per cent.

Identifying Deaths

Three methods were used to ascertain death of one or both members of a couple:

1. Widows and widowers were identified in the 1891 Census.
2. A search was made of the BMD civil register index of deaths.
3. An attempt was made to trace all identified deaths in the *Ancestry* probate calendar index.

As previously noted, the most difficult part of the research is the quality of the death register index and the limited information in it. Criteria for deciding on a match therefore included registration in the known census district of enumeration in 1881 and/or known enumeration district (of sample member of their surviving spouse) in 1891. In order to examine this assumption, an analysis was made of death entries for the spouses of husbands and wives who were listed as widowers and widows in the 1891 census. Of 61 such cases that occurred in the period 1881-1891, it was possible to trace 49 – 80.3 per cent – in the death register index. These findings illustrate the value of having two methods of measuring the incidence of deaths. Up to 20 per cent of deaths were not located in the death register index, but the data on widowers and widows allows us to correct for this deficiency. The latter information indicates that a death took place within a particular decade, whereas for about 80 per cent of cases it is possible to identify the exact quarter and year of death.

The above figures on the identification of deaths assume that a death that occurs within an appropriate enumerated registration district is correctly identified. In order to test this assumption a search was made in the *Ancestry* probate calendar index for all identified

deaths cases, both those of spouses of surviving widows and widowers and those identified independently.

Table 2: Deaths Identified in the Civil Register Index Traced in the Probate Calendar Index, 1881-1891.

	Total Deaths Listed In Civil Register Index	Number Traced In Probate Calendar	Proportion Traced
Elite Males	24	21	87.5%
Elite Females	13	2	15.4%
Male Labourers	22	2	9.1%
Labourers' Wives	15	1	6.7%
Total	74	27	36.5%

As perhaps expected, it was possible to identify a much higher proportion of elite males in the probate calendar than other groups. In every case, the information in the calendar indicated that death register index entries were correct, in most cases listing the names of widows and widowers, along with details of address and other identifying information. The calendar entries include data on the amount of personal estate, which will be of value in classifying socio-economic status in future work.

Table 3: Adult Mortality among Couples in Elite and Labourers' Families, 1881-1891.

	Elite Husbands	Labourer Husbands	Elite Wives	Labourer Wives	Total
Number In 1881	156	156	156	156	624
Number Traced 1881-91	146	142	136	140	564
Number Alive In 1891 Census	115	117	121	121	474
Number Dead Through Census Tracking	23	16	14	15	20
Number Dead Through Civil Register	8	9	1	3	21
Proportion Dead Of Traced Cases	21.2%	17.5%	11.0%	12.9%	15.8%
Mean Age (Years) in 1881	48.0	43.0%	43.2	41.5	44.1

Table 3 summarizes the results discussed above, and shows the estimate of the proportion of each group who died 1881-1891 derived from these various sources. This suggests higher survival among women than men but little difference in the mortality of elite and labourer groups. However the distribution of the samples by age group varied slightly and the mean age of labourers (42.4) was slightly younger than that of the elite (45.6) (although the difference was not statistically significant). Results from a logistic regression model in which the outcome was dichotomised to alive/dead (and those untraced were excluded) and including age (single years), sex, elite/labourer status and rural or urban residence showed that odds of death did not vary significantly by elite/labourer status (or for labourers relative to elite: 1.06, 95% confidence interval 0.66-1.73). (Table 4)

Table 4: Logistic Regression of Adult Mortality among Couples in Elite and Labourers' Families, 1881-1891.[18]

	Odds Ratio	95% CI	P
Labourer (Ref. Elite)	1.068	0.658-1.732	NS
Women (Ref. Men)	0.679	0.416-1.108	NS
Age	1.062	1.043-1.081	<0.00

Table 4 shows, that as would be expected older age was associated with an increased risk of death by 1891, but that there was no significant difference between labourers and the elite.

Discussion

There is a well-established association between social class and adult mortality in England from the early twentieth century onwards. However, this association may not have been evident in earlier periods raising questions about the pathways between social inequality and adult mortality in differing historical contexts.

For the present research, a national sample of 312 married couples was selected from the 1881 English Census comprising four elite and four labourer couples drawn from one urban and one rural parish in each county of England. Mortality 1881-1891 was ascertained through linkage to the 1891 Census and the civil register death index. About ninety per cent families were traced in the census or the death index. Results showed no significant differences between mortality of elite and labourer couples for either husbands or wives

These results illustrate firstly the potential for linking several data sources to provide more information about variations in mortality in the late nineteenth century. Triangulation was used in which transitions from being married to widowed were used to help identify deaths of spouses. However this method does have limitations. Firstly in both contemporary and historical populations it is known that the married have better health and lower mortality than the non married, so the sample is selected to some extent. Secondly, loss to follow up may be associated with death of both spouses. For these reasons and the way the sample was selected, it is not truly random, although the design meant that those included were matched geographically and so avoids problems of the distorting effects of place.

The extent, origin, and evolution of inequalities in health in England and elsewhere is a major topic of current debate in social policy and epidemiology, particularly as such inequalities appear to have widened in the last quarter of the twentieth century.[19] As noted by Wilkinson and Pickett, although social inequality was greater in earlier historical periods, there are some indications that these inequalities were not reflected in health differentials to the same extent as in contemporary populations.[20] Studies which have compared the aristocracy and the total population, for example, suggest that there were minimal associations between socio-economic status and adult mortality prior to and into the nineteenth century.[21] Preston and Haines also concluded from their analysis of child mortality in late nineteenth century America that differentials by level of income were not important.[22] More

[18] Number = 590, excluding those not traced.

[19] Davey-Smith, *Poverty*; Wilkinson et.al., *The Spirit Level*.; J. Spijker, L. Van Wissen, 'Socioeconomic determinants of male mortality in Europe: the absolute and relative income hypothesis revisited', *Genus*, Volume 66, 2010.

[20] Wilkinson et.al., *The Spirit Level.*

[21] A. Day Bailey Hutchinson, 'On the rate of mortality prevailing amongst families of the peerage during the nineteenth century', *Journal of the Statistical Society*, Volume 24, 1863.

[22] S.H. Preston, M.R. Haines, *Fatal Years: Child Mortality in Late Nineteenth century America,* 1991.

generally, Preston has argued that before the modern scientific understanding of how life style and personal health behaviour influence disease risks, the disease environment was more important than socio-economic status in shaping changing mortality patterns.[23]

Indeed greater material resources may have had some negative effects in enabling lifestyles including excessive consumption of high fat foods and alcohol and limited physical exercise.[24] There is evidence to suggest that the rural poor were forced to grow their own food, were unable to consume large amounts of alcohol because of their poverty, and were required to engage in intense physical activity as a result of their working conditions. By contrast, the wealthy are known to have consumed large amounts of rich food, alcohol and tobacco, and engaged in only in minimal amounts of physical activity because of the presence of household servants.[25] Thus in the nineteenth century for certain conditions, such as heart disease, there is some evidence of a reverse gradient (with richer people having poorer health).[26] Research in Sweden, Denmark, Holland and Switzerland has supported these conclusions, suggesting that the association between socio-economic status and all-cause adult mortality only emerged at the end of the nineteenth century, and that before the twentieth century 'overall, a causal link between income and mortality is put into question.'[27]

Our results provide some limited evidence to suggest that there were no major socio-economic differences in all-cause adult mortality at the end of the nineteenth century. The above conclusions are however provisional, as there is no large-scale national data at the individual family level on socio-economic status and adult mortality to reliably establish the link between socio-economic status and adult mortality. The present paper can be viewed as a first step in creating such national data and further clarifying the historical relationship between social inequality and adult mortality

[23] S.H. Preston, 'The changing relationship between mortality and level of economic development' *Population Studies*, Volume 29, 1975.
[24] M. Livi-Bacci, *Population and Nutrition: an Essay on European History*, 1991; P. Razzell, C. Spence, 'The hazards of wealth: adult mortality in pre-twentieth century Britain', *Social History of Medicine*, Volume 19, 2006.
[25] Razzell and Spence, 'The hazards'.
[26] M. Marmot, R.G. Wilkinson, *Social Determinants of Health*, 1999.
[27] T. Bentsson, F. Van Poppel, 'Socioeconomic inequalities in death from past to present: An introduction' *Explorations in Economic History*, Volume 48, 2011.

Rateable Value as a Historical Measure of Socio-Economic Status.

T.H.C. Stevenson's classification of occupations into social class categories in 1913 has had a major influence on demographic, sociological and epidemiological research in Great Britain since its inception. As Simon Szreter wrote in 1984, 'As well as it's being common currency among empirical sociologists researching contemporary issues, it has achieved something of an ascendancy amongst social historians of modern Britain, too ... [it] has been projected both forward and backwards in time, upto seventy years in each direction from its date of inception, 1913.'[1]

Stevenson mainly relied on perceived skill levels for his system of classification, consistent with his belief about the importance of cultural knowledge in shaping patterns of mortality and fertility.[2] In discussing the role of income, he wrote:

> its drawback is that it may fail altogether as an index of culture, probably the more important influence. The power of culture to exert a favourable influence on mortality, even in the complete absence of wealth, is well illustrated by the case of the clergy. The income test, if it could be applied, would certainly place them well down the list, yet their mortality is remarkably low ... the lower mortality of the wealthier classes depends less upon wealth itself than upon culture, extending to matters of hygiene ... poverty [is] much more closely associated with low social status than wealth with its opposite.[3]

This implies that culture was more important for the wealthy and income for the poor, which is perhaps why he somewhat ambivalently concluded that although social position was 'largely but by no means exclusively a matter of wealth or poverty, culture also [has] to be taken into account', and that 'any scheme of social classification should take account of culture as well as of wealth.'[4]

This ambivalence was reflected in the classification of clerks, who were placed in Social Class 1 in 1911, whereas the artisan was classified in a lower social class, 'even though his wage may be higher than the clerk's.'[5] In 1921 clerks were demoted to Class 2 and by 1931 were relegated even further to Class 3. This suggests a degree of confusion and ambiguity in the system of categorisation, one of many, due to the lack of a clear system of classification. Stevenson presented evidence in 1923 to show that clerks had a higher infant mortality rate than other groups in Social Class 1, and this presumably was one of the reasons why he re-classified them into Social Class 2 in 1921.[6] This in effect created a self-defining system, with adjustments made to social class of class and mortality variables.

Using infant and other forms of mortality as an indication of poverty is historically

---

[1] S. Szreter, 'The genesis of the Registrar-General's social classification of occupations', *British Journal of Sociology,* 35, No. 4 (1984).
[2] T.H.C. Stevenson, 'The vital statistics of wealth and poverty', *Journal of the Royal Statistical Society,* 91 (1928), pp. 207-230. Stevenson relied primarily on infant mortality rates to assess his classifications of occupations.
[3] Ibid, pp. 209, 214.
[4] Ibid, pp. 210,214.
[5] General Register Office, *Census of England and Wales, 1911,* Volume 10, Occupation and Industries,Part 2 (HMSO, 1913), p. xii.
[6] T.H.C. Stevenson, 'The social distribution of mortality from different causes', *Biometrika,* 15 (1923), p. 386.

questionable. There is evidence for example that mortality was higher in the 1840s in wealthy districts of London than poorer areas.[7] Rateable value was used by the Registrar General to measure the relative poverty and wealth of registration districts in the city, with the poorest East End districts having much lower mean rateable values than the prosperous West End. A similar pattern is to be found in Registrar General's statistics for the 1880s.

Table 1: Mortality Rates per 1000 in London Registration Districts, 1881-1890.[8]

Registration District	*Mean Rateable Value (£), 1891*	*Mortality Rates*			
		Infant Mortality Rate	*Under Five Years*	*25-34 Years*	*35-44 Years*
Bethnal Green	23.0	157	76	8.6	14
Mile End	25,3	146	69	6.4	12
Camberwell	26,2	143	60	6.6	12
Poplar	27.8	148	68	8.9	15
Greenwich	29.4	147	66	9.0	13
Fulham	29,8	161	68	6.3	10
St, Georges in the East	32,3	182	88	9.6	16
Hackney	32.4	137	60	7.1	11
Lambeth	34.8	145	67	7.8	13
Lewisham	36.7	121	45	4.5	8
Mean Average	**29.8**	**148.7**	**66.7**	**7.5**	**12.4**
Shoreditch	36.9	168	78	78	13
Whitechapel	38.1	173	85	17.2	29
Islington	39.5	144	61	6.6	11
Wandsworth	39.5	141	57	6.3	9
Chelsea	49.3	160	74	8.6	15
St. Pancras	49.6	153	67	8.6	15
Holborn	49.7	164	82	6.8	11
Marylebone	66.5	148	75	6.8	12
St. Saviour's	70.7	166	79	7.1	12
Mean Average	**48.9**	**157.4**	**73.1**	**8.3**	**14.1**
Westminster	70.7	163	72	6.9	14
Kensington	73.3	154	63	6.6	12
Hampstead	73.5	117	49	5.4	9
St. Olave's	81.2	156	73	11	17
Paddington	83.5	143	62.9	6.3	11
St. Giles	87.6	154	80	6.5	13
Strand	88.7	226	110	13.7	25
City	136	171	90	20.6	33
St. George's Hanover Square	141.6	153	71	8.6	16
Mean Average	**92.9**	**159.7**	**74.6**	**9.5**	**15.7**

[7] See P. Razzell, *Population and Disease: Transforming English Society, 1550-1850* (London, 2007), pp. 136, 137.
[8] *Registrar-General's Decennial Supplement, 1891*.

This table indicates that mean rateable value accurately measures the relative poverty and wealth of London's registration districts, with poor East End areas having significantly lower values than the wealthy West End districts. As with the findings for the 1840s, the poorer districts had lower mortality rates on average than the wealthy areas, and this was probably a function of 'the hazards of wealth' – an excessive consumption by the wealthy of alcohol, tobacco and food, along with a relative lack of exercise.[9] The association between poverty and infant mortality was historically variable,[10] and so Stevenson's reliance on infant and other forms of mortality to classify occupations is therefore questionable. His difficulty was the lack of independent and objective evidence with which to construct his system of class classification. He appears to have fallen back on current notions of the status and poverty/wealth of particular occupations, and where these were at the extremes – such as professionals contrasted with labourers – there were no great difficulties. It was the large majority of intermediate occupations that created major problems – including the swollen Class 3 category which constituted about a half of the total population – with the allocation of particular occupations to specific class categories appearing arbitrary and ambiguous.

There was also the problem of occupations which were strongly associated with particular geographical locations, such as agricultural labourers, where their rural environment strongly influenced mortality patterns independent of their level of poverty. Agricultural labourers were amongst the poorest occupational groups in England, and yet their levels of infant and adult mortality were some of the lowest in the country.[11] Likewise, miners were a relatively well-paid occupational group, and yet had a high level of infant mortality.[12] It was perhaps for these reasons that Stevenson constructed in 1913 special class categories for these two occupational groups, but in doing so, created further ambiguity and a lack of clarity.

Stevenson's 1913 classification of social class did not use employment status, whereas the subsequent 1921 system of categorisation did include such information. Although the new system expanded the number of occupational categories – from 373 in 1911 to 989 in 1921 – the former is in certain respects more appropriate for some forms of research, as it relies on occupational description without details of employment status. Occupation data has been used widely in census reports, but as has been pointed out, 'little empirical evidence exists to support the claim that census groupings by occupation were homogenous with regard to social standing.'[13]

However, in spite of its almost universal use, Stevenson's system of classification has attracted widespread criticism. It was finally replaced in 2001 by the new O.N.S. system of classification, *National Statistics Socio-Economic Classification* [NS-SEC]. The lead authors of the new system, David Rose and David Pevalin, have summarised the reasons for its replacement as follows: 'The limitations of SC [Social Class Based on Occupation], which remained almost unchanged from 1921 until its demise, are legion. It has been correctly described as

[9] See P. Razzell and C. Spence, 'The hazards of wealth' in P. Razzell, *Essays in Historical Sociology*, 2021. See also Razzell, *Essays*, pp. 169, 196. 200. 250. 260, 261, 264 for evidence of higher mortality amongst the wealthy.
[10] P. Razzell, *Mortality, Marriage and Population growth in England, 1550-1850*, 2016, pp. 37-41.
[11] Haines, 'Socio-economic differentials', p. 313.
[12] Ibid.
[13] Nottingham Elites and Civil Society 1900-1950: Status, Engagement and Lifestyle, Online https://Nottingham-elites.org.uk/housing.php, p. 4.

an intuitive or a priori scale. A plethora of articles and book chapters have appeared in the last twenty years calling attention to its problems'[14]

The NS-SEC system attempts to resolve these difficulties by re-classifying occupations. It requires the identification of a 'household reference person' – and 'that person's [occupational] position to stand for the whole household.' The reference person is 'responsible for owning or renting' the household, and in the case of joint householders, 'the person with the highest income takes precedence.'[15] This means that information on the income of two or more household members is not included in the final socio-economic classification of occupations, and with the historical growth of women's employment, this is a serious flaw in the new system. It also suffers from the fact that most historical datasets, including birth, marriage and death certificates, parish registers, vaccination birth registers, valuation rolls and other datasets, do not have information on employment conditions. All these latter sources are used widely by social historians and others.

One potential way around this difficulty is to establish the economic value of residential properties, reflecting the income and economic statusof all members of the household. This shifts the analysis of socio-economic classification away from employment relations to ranking by household economic value. The NS-SEC is a non-hierarchical categorical scheme with a set number of social classes defined by qualitative employment relations,[16] whereas the linking of occupations to household economic value represents a quantitative hierarchical continuous system. Continuous schemes of classification allow an indefinite number of socio-economic categories.

Rateable value is a numerical measure of household economic value, and was levied universally in all areas of England, Scotland, Wales and Northern Ireland. It was based on an assessment of the annual rent of an individual property. Evidence exists to show a significant association between rateable value and subjectively defined social class. Research on the town of Nottingham found the following link:

Table 2: Rateable Value and Subjectively Defined Social Class in Nottingham, 1900-50.[17]

	Upper-Middle Class	Middle-Middle Class	Lower-Middle Class	Skilled Working Class
Mean Rateable Value(£)	103	48	19	11

A study of Glasgow examined the association between rateable value and occupational class, using Stevenson's 1913 classification of occupations.

Table 3: Rateable Value and Social Class Classification of Occupations in Glasgow, 1911.[18]

Social Class (Stevenson 1911)	Number of Occupations	Mean Rateable Value (£)

[14] D. Rose and D.J. Pevalin, *A Researcher's Guide to the National Statistics Socio-economic Classification* (London, 2003), pp. 1, 2.
[15] *The National Statistics Socio-economic classification (NS-SEC)*, Office of National Statistics.
[16] Ibid
[17] Ibid, p. 5.
[18] Only occupations with fifty or more cases were included in the analysis. The figures are based on data on occupations and rateable value in the Glasgow 1911 Land Duty Survey. It was possible to code only 135 of the total of 252 occupations into social class categories – 53.6% – and this was because of the ambiguity of the descriptions of occupations both in the Land Duty Survey and Stevenson's classification of occupations.

Class 1	25	36.0
Class 2	22	21.4
Class 3	57	12.1
Class 4	21	11.5
Class 5	10	9.1

The association between household economic value and social class is linear in both the above tables, indicating that rateable value is a significant measure of socio-economic status. It is possible to assess the status of individual occupations by measuring the average rateable value of these occupations. This provides an objective quantitative assessment which Stevenson lacked when he was compiling his 1913 social class classification. The Land Duty Survey for the whole of Great Britain was carried out by the Inland Revenue in 1911, and provided information on both occupation and rateable value of addresses, running parallel to the 1911 Census. This will allow analysis of local and regional variations, as well as compiling an overall national classification of social classes.

Historically, rateable value was a numerical measure of the market value of a property, and is therefore particularly suitable for the measurement of household economic status. Research carried out by J.R. and U.K. Hicks on the incidence of local rates in Great Britain in 1937 and 1938 included data on the relationship between average household expenditure per head and gross rents/ rateable value. Figures are available for gross rents and rateable value for the North of England, and gross rents for Scotland as follows:

Table 4: Household Expenditure and Rents/ Rateable Value in the North of England and Scotland, 1937, 1938.[19].

Households With Average Expenditure per Head per Week Of	*North of England*		*Scotland*
	Gross Rents	Rateable Value	Gross Rents
Under 10 Shillings	£22.5	£6.4	£16.5
10 Shillings but Under 20 Shillings	£23.6	£6.7	£19.9
20 Shillings but Under 30 Shillings	£26.9	£7.6	£22.5
30 Shillings and Over	£30.2	£8.6	£24.9

There is a linear relationship between household expenditure and gross rents/ rateable value in the North of England and Scotland, although the association appears to be stronger in the latter than the former. There is little data on the direct relationship between income and household economic value, but a household survey carried out in the United Kingdom in 1966 included information on gross family income and average gross rent – which is directly related to rateable value – as follows.

Table 5: Gross Family Income and Average Gross Rent in the United Kingdom. 1966.[20]

Average Income Per Week	*Number of Households*	*Average Rent in Shillings per Week*

[19] J.R. Hicks and U.K. Hicks, *The Incidence of Local Rates in Great Britain* (Cambridge 1945), p. 25.
[20] *Family Expenditure Survey Report,* HMSO 1961.

Under £3	143	24.31
£3-to under £6	285	32.65
£6 to under £8	323	40.89
£8 to under £10	416	43.01
£10 to under £14	521	46.33
£14 to under £20	478	50.15
£20 to under £30	572	59.50
£30 to under £50	272	56.46
£50+	264	95.10

There is a strong linear relationship between gross family income and average weekly rent – approximately quadrupling between the lower and higher income categories. There are similar correlations for York in 1901, and Bristol in 1937.[21]

Although rateable value is not a direct measure of income, it has advantages over data which relies primarily on pay and income for individual occupations, as it reflects total family income and wealth, as well as lifestyle. Nick Hayes in a review of rateable value and other measures of status has concluded that

> the house ... was the most visible social guide to a family's level of income; moving house – 'up' or 'down' – the surest indicator of changing aspiration or financial circumstance, and for most the single most important expression of their position in society. For the historian, housing offers a common, attenuated spine around which status was woven, a means by which both 'objective' class and 'subjective' status can be jointly valued and assessed ... Economic valuations (being based on nominal rents) took into account ... physical appearance ... embellishment beyond cost, as well as the size of the house and its area location (salubriousness, amenities) – and around the totality of which individual and family 'lifestyle' was located and fixed.[22]

This quote indicates that rateable value is a measure of cultural identity as well as economic status, confirmed by the claim that 'families brought with them specific sets of cultural values ... not simply between classes but within (between "rough" and "respectable" for example), where quality of housing stood as a reasonable proxy for the neighbourhood's "general sense of wellbeing" and income level.'[23] Given the importance of cultural values for calculating socio-economic status, the association between economic household value and culture as well as income, makes it an invaluable measure of status.

Hayes has presented evidence on probate and economic household value for a sample of 459 people in Nottingham during 1934, and the following table indicates that there was a linear relationship between wealth and rateable value.

Table 6: Probate Levels and Median Rateable Value in Nottingham, 1934.[24]

[21] B. Seebohm Rowntree, *Poverty: A Study of Town Life*, 1901, p. 165; A.W.T. Ellis, 'Rents, rates and incomes in Bristol, 1937', *Review of Economic Studies,* 11, 2 (1944), p. 104.
[22] N. Hayes, 'Calculating class: housing, lifestyle and status in the provincial English city, 1900- 1950', *Urban History,* 26, 1 (2009), pp.123, 125.
[23] Nottingham Elites, op.cit., pp. 2, 3.
[24] Hayes, op. cit., p. 132.

Probate Levels	*Median Rateable Value*
£1-£900	£23
£1,000-£1,999	£32
£2,000-£4,999	£52
£5,000-£9,999	£66
£10,000-£24,999	£72
£25,000-£49,999	£88
£50,000-£99,999	£109
Over £100,000	£145

One of the main advantages of household economic value is that it constitutes an ordinal scale running from very low to high values, allowing a detailed breakdown across a complete range of measures, and providing an objective and independent quantitative measure for assessing socio-economic status. It is important to have data for individual cities and towns, as rateable values varied from place to place,[25] so that it is the comparisons between different individuals and groups within communities that will generate most appropriate relative measures of status.

An illustration of the classification of occupation is to be found in the example of Glasgow in 1911, using the Land Duty Survey for that period, and giving information on occupation and rateable value. The following table focuses on the categories of social classes 1, 2, 4 and 5.yields the following results.

Table 7: The 1911 Valuation Duty Survey of Glasgow.

Occupation	*Number of Cases*	*Mean Rateable Value (£)*	*Social Class (Stevenson)*
Chartered Accountant	75	70.4	1
Merchant	288	67.9	1
Wine Merchant	73	63.4	1
Physician	273	61.8	1
Surgeon	166	61.6	1
Clergyman	315	50.7	1
Architect	81	41.5	1
Accountant	117	41.1	1
Spirit Merchant	174	37.0	1
Builder	119	36.0	1
Journalist	66	33.4	1
Dentist	122	32.9	1
Schoolmaster	59	32.3	1
Artist	53	28.9	1
Bank Clerk	66	26.5	1
Commercial Traveller	74	26.5	1
Manager	706	26.4	1
Buyer	74	26.3	1
Agent	330	26.1	1
Teacher	384	25.2	1
Chemist	208	25.0	1
Clerk	3,837	16.8	1

[25] Ibid, pp. 24, 25.

Insurance Agent	355	15.7	1
Broker	69	14.2	1
Salesman	2,004	13.1	1

Occupation	*Number of Cases*	*Mean Rateable Value (£)*	*Social Class (Stevenson)*
Writer	287	59.8	2
Clothier	168	30.4	2
Teacher Of Music	63	30.3	2
Pawnbroker	77	27.8	2
Ironmonger	168	25.6	2
Jeweller	159	25.0	2
Tobacconist	81	25.0	2
Stationer	282	23.8	2
Draper	510	20.7	2
Traveller	2,373	20.3	2
Book-keeper	260	19.8	2
Photographer	94	18.9	2
Dairyman	208	18.5	2
Grocer	946	18.1	2
Fruiterer	118	17.5	2
Butcher	801	15.2	2
Fishmonger	94	15.0	2
Engraver	128	13.8	2
Baker	1,537	13.2	2
Tailor	587	13.0	2
Dealer	285	10.3	2
Coal Dealer	114	9.8	2

Occupation	*Number of Cases*	*Mean Rateable Value (£)*	*Social Class (Stevenson)*
Warehouseman	1800	19.7	4
Miller	87	15.5	4
Steward	248	13.2	4
Attendant	72	12.7	4
Hairdresser	365	12.4	4
Postman	570	12.4	4
Caretaker	167	12.2	4
Cooper	399	11.9	4
Engine Driver	582	11.4	4
Gardener	236	11.3	4
Currier	94	11.2	4
Mechanic	500	10.7	4
Turner	285	10.6	4
Barman	52	10.4	4
Wood Turner	106	10.2	4
Ironworker	352	9.9	4
Soldier	50	9.8	4
Machinist	455	9.6	4
Railway Porter	75	9.5	4
Sawyer	328	9.2	4
Carter	297	8.5	4

Occupation	*Number of Cases*	*Mean Rateable Value*	*Social Class (Stevenson)*
Watchman	390	11.5	5
Brushmaker	87	11.0	5
Railway Servant	134	10.3	5
Cabman	122	9.3	5
Porter	746	9.3	5
Platelayer	69	8.7	5
Labourer	19,876	7.3	5
Hawker	111	6.8	5
Dyer	168	9.5	6
Miner	899	7.0	7

There is marked variation in rateable values both within and between social class categories, which indicates that a revision is necessary to establish an accurate social class classification. A repeat of this exercise for other cities, towns and rural areas will eventually` enable the creation of a reliable national social class system, suitable for social historical, demographic and epidemiological research.

An example of the use of rateable value is the study of child mortality in Hertfordshire in 1923-39.[26] The Hertfordshire Health Visitors Register was used by David Barker and colleagues for the development of their 'fetal origins' hypothesis, but their research lacked a measure of socio-economic status. The following table summarises an analysis of economic household value at birth and its association with measures of infant and child mortality in five Hertfordshire towns.

Table 8: Rateable Value and Infant and Child Mortality in Five Hertfordshire Towns, 1923-1939.[27]

Rateable Value	Number of Live Births	Infant Mortality Rate per 1000	Number of Children (1-4) at Risk	Child Mortality Rate per 1000
£3-5	1341	48	1203	22
£7-10	3683	44	3401	17
£11-14	2137	41	1826	13
£15-18	843	43	702	13
£19-22	493	29	427	14
£23+	808	24	681	12

Although not perfectly linear, the table reveals that there was a significant association between household economic value and infant and child mortality. Rateable value is a numerical measure which is invaluable as research tool for future research, not requiring interpretative coding and providing a continuous gradient for the measurement of socio-economic status, and is historically available for most districts in the nineteenth and twentieth centuries in all areas of the United Kingdom.[28]

[26] P, Razzell, C. Spence, K. Vines, 'Poverty, birth weight and infant weight gain in Hertfordshire, 1923-1939', *International Journal of Epidemiology,* 33 (December 2004), pp. 1228-1233.

[27] The five towns are Hertford, Hitchin, Berkhampstead, Hoddesdon and Bishops Stortford. For some of the data included in this Table see Razzell, Spence, Vines, op.cit.

[28] Rateable Value was abolished in 1993 and replaced by Council Tax, with valuations running in eight bands from £40,000 to £320,000. This should allow future researchwhich uses data from these tax bands.

The Historical Socio-Economic Classification of Occupations through Measures of Rateable Value.

The classification of social class has been a source of controversy, since Stevenson's official 1913 eight-fold class categories. He used an intuitive assessment of skill and education for the basis of his classification, on the assumption that socio-economic status was based on a combination of income and culture. He argued that there was an association between the classified social classes and measures of mortality and fertility, although there is evidence that this was not true for periods before the twentieth century.[1] His problem was that he did not have an objective and independent method of assessing the accuracy of his method of classification.

Stevenson himself was cautious in his claims for the accuracy of his system of classification. He wrote: 'This assignment is by no mean precise, for in many cases, especially in commerce and industry, the census occupational description gives no certain indication of social position. The farmer for instance may farm 10 acres of 1,000, and the draper or iron puddler may be the head of a large establishment or his lowest paid assistant or labourer. As a result, many men, especially business men, belonging to the middle classes have necessarily been included with the working class...'[2]

His system of social class categorisation has been used almost universally by social historians, demographers and epidemiologists. However, it has attracted a great deal of criticism. It was finally replaced in 2001 by the new O.N.S. system of classification, *National Statistics Socio-Economic Classification* [NS-SEC]. The lead authors of the new system, David Rose and David Pevalin, have summarised the reasons for its replacement as follows: 'The limitations of SC [Social Class Based on Occupation], which remained almost unchanged from 1921 until its demise, are legion. It has been correctly described as an intuitive or a priori scale. A plethora of articles and book chapters have appeared in the last twenty years calling attention to its problems'[3]

The NS-SEC system attempts to resolve these difficulties by re-classifying occupations. It requires the identification of a 'household reference person' – and 'that person's [occupational] position to stand for the whole household.' The reference person is 'responsible for owning or renting' the household, and in the case of joint householders, 'the person with the highest income takes precedence.'[4] This means that information on the income of two or more household members is not included in the final socio-economic classification of occupations, and with the historical growth of women's employment, this is a serious flaw in the new system. It also suffers from the fact that most historical datasets, including birth, marriage and death certificates, parish registers, vaccination birth registers, valuation rolls and other forms of data, do not have information on employment conditions. All these sources are used widely by social historians and other social scientists.

What is required is a way of independently assessing the validity of any system of social class classification, and there is data which meets this requirement – rateable value of households. It is based on the rental value of property, which is a measure of socio-economic status.[5]

---

[1] See P. Razzell, 'Rateable Value as a Historical Measure of Socio-Economic Status' on *Academia.*

[2] *Seventy-Fourth Annual Report of the Registrar General*, p. xli.

[3] D. Rose and D.J. Pevalin, *A Researcher's Guide to the National Statistics Socio-economicClassification* (London, 2003), pp. 1, 2.

[4] *The National Statistics Socio-economic classification (NS-SEC)*, Office of National Statistics.

[5] Although this essay is a discussion of historical measures of rateable value, it will be possible in future to use the eightfold council tax bands currently in operation.

Available research shows that rateable value was historically associated with levels of income, wealth, household expenditure, and measures of social class.[6] This can be illustrated by Hayes's research on probate and economic household value for a sample of 459 people in Nottingham during 1934, and the following table indicates that there was a linear relationship between wealth and rateable value.

Probate Levels and Median Rateable Value in Nottingham, 1934.[7]

Probate Levels	*Median Rateable Value*
£1-£900	£23
£1,000-£1,999	£32
£2,000-£4,999	£52
£5,000-£9,999	£66
£10,000-£24,999	£72
£25,000-£49,999	£88
£50,000-£99,999	£109
Over £100,000	£145

Rateable value was used by the Registrar General to measure the relative poverty and wealth of registration districts in London in the 1840s, with the poorest East End districts having much lower mean rateable values than the prosperous West End.[8] This was also the case in the 1880s with similar associations between rateable value and the poverty/wealth of registration districts.[9] In addition to economic measures, rateable value also provided information on culturally defined aspects of social status. Nick Hayes in a review of rateable value and other measures of status has concluded that

> the house ... was the most visible social guide to a family's level of income; moving house – 'up' or 'down' – the surest indicator of changing aspiration or financial circumstance, and for most the single most important expression of their position in society. For the historian, housing offers a common, attenuated spine around which status was woven, a means by which both 'objective' class and 'subjective' status can be jointly valued and assessed ... Economic valuations (being based on nominal rents) took into account ... physical appearance ... embellishment beyond cost, as well as the size of the house and its area location (salubriousness, amenities) – and around the totality of which .individual and family 'lifestyle' was located and fixed.[10]

This quote indicates that rateable value is a measure of cultural identity as well as economic status, confirmed by the claim that 'families brought with them specific sets of cultural values ... not simply between classes but within (between "rough" and "respectable" for example), where quality of housing stood as a reasonable proxy for the neighbourhood's "general sense of wellbeing" and income level.'[11]

In 1911 the Inland Revenue Office introduced a Land Duty Survey which covered the whole of the United Kingdom. This included information on all forms of property, including land and buildings, with summary statements of rateable value. Additionally, all local authorities were required to levy taxes on properties to provide revenue

---

[6] Razzell, 'Rateable Value', Academia.
[7] Hayes, op. cit., p. 132.
[8] See P. Razzell, *Population and Disease: Transforming English Society, 1550-1850* (London, 2007), pp. 136, 137.
[9] Razzell' Rateable Value' Academia.
[10] N. Hayes, 'Calculating class: housing, lifestyle and status in the provincial English city, 1900- 1950', *Urban History,* 26, 1 (2009), pp.123, 125.
[11] Nottingham Elites and Civil Society 1900-1950: Status, Engagement and Lifestyle, Online https://Nottingham-elites.org.uk/housing.php, pp. 2, 3.

for local government, and this information is available for most areas in the United Kingdom from the nineteenth century and earlier. The Land Duty Survey includes information on occupation and rateable value, and runs parallel to the 1911 Census, allowing detailed research on the classification of occupations.

A preliminary unpublished study the 1911 Land Duty Valuation Register in Glasgow enables a detailed and independent analysis of the classification of occupations. Provisional data suggests there was considerable variation both within and between Stevenson's social class categories, so that for example the households of Social Class 1 merchants have an average rateable value of £67.9 compared to £13.1 for Social Class 1 salesmen. The occupation designated as writers in Social Class 2 had a mean value of £59.8 and schoolmasters £32.3, indicating that Stevenson's system of classification is inconsistent at these social class levels. His system is more accurate at lower status levels, so that labourers' households in Glasgow had a mean rateable value of £7.3 and miners £7.0, the lowest measures so far recorded in the research.[12]

Stevenson's classification also suffers from a greatly swollen Class 3 category, with nearly a half of all occupations at this level. Additionally he created three additional categories for agricultural labourers, textile workers and miners, as these did not fit in the pattern of mortality and fertility that he created. In the case of agricultural labourers, this was probably due to the rural nature of their residence.

Rateable Value overcomes all these problems as it is a precise, numerical measure derived on a local basis, and provides information for the calculation of a gradient from very high to very low levels of status. It can be used both directly for the calculation of status and for the classification of occupational socio-economic categories. For future research it will allow the gradual establishment of a revised national classification of occupations, invaluable for historical, demographic and epidemiological research.

[12] For fuller details on occupation and rateable value see the paper 'Rateable value as a historical measure of socio-economic status' on Academia.

Urban inoculation and the decline of smallpox mortality in eighteenth century cities.

BY PETER RAZZELL

This article is a response to Davenport, Boulton and Schwarz's article, 'Urban inoculation and the decline of smallpox mortality in eighteenth century cities – a reply to Razzell'. It introduces new data on smallpox in the London parishes of St. Dunstan Stepney and St. John Wapping. This new evidence confirms that there was a reduction in adult smallpox, but that there was no increase in the concentration of the disease amongst young infants. This data also reveals – along with that from St. Mary Whitechapel and the Bills of Mortality – that there was a significant decline in smallpox mortality from the 1760s onwards, consistent with the known practice of inoculation in London and its rural southern hinterlands. Additional evidence from Holy Trinity Whitehaven and the whole of Sweden confirms that the disease did not become increasingly concentrated among young infants in the second half of the eighteenth century. Evidence is also presented to show that Edward Jenner's vaccination in its early years was an attenuated form of the old inoculation. It is concluded that the practice of inoculation and vaccination represented a major achievement in preventative medicine.

Davenport, Boulton and Schwarz have presented further evidence for the increasing concentration of smallpox amongst young infants, arguing that this resulted from a growth in the disease's infectiousness. In rejoinder Razzell has concluded that these changes were due to the practice of inoculation (variolation) in London and its rural hinterland.[1] There is agreement that adult smallpox burials largely disappeared in London at the end of the eighteenth century. There is also consensus that there was a significant difference in the age profiles of the disease between the south and north of Great Britain, with both adult and childhood smallpox burials in the south, but almost exclusively young child burials in the north. There is also agreement that inoculation played a part in reducing adult smallpox in the south of England, which was the migration hinterland of London, contributing to the fall in adult mortality.

The authors have also published new data on age profiles and the levels of smallpox mortality in Manchester, along with a reconstitution study of St. Martin in the Fields. Both sets of data show an increasing concentration of the disease in younger age groups and a growth in mortality levels.

London however was much larger than Manchester in 1801, with a population of 1,117,000 compared to 70,409[2] – about sixteen times greater – and was by far the largest urban area in England. Clarification of the pattern of smallpox in London is therefore the most important issue for the understanding of urban smallpox at the end of the eighteenth century.

I

[1] Davenport, Boulton and Schwartz, 'Urban inoculation'; Razzell, 'Decline'.
[2] Davenport *et.al.*, 'Urban inoculation', 194; Razzell and Spence, 'History'.

There were difficulties in the registration of smallpox in the eighteenth century, and as Dr Percival wrote in 1758:

> A considerable number of those who die of the natural disease [of smallpox], before the expulsion of the variolous eruption, are infants or very young children … Hence the convulsive paroxysms which often precede the appearance of the pustules … are always alarming, and when they happen to very young infants are frequently fatal.[3]

Subsequently in 1793 Haygarth confirmed the importance of convulsions resulting from smallpox, and the way they distorted the statistics of mortality:

> The disease most fatal to infants to is convulsions, arising from various causes; one of them is the small-pox. The two circumstances will explain the reason why, under one year old, the proportion of deaths by the small-pox is less than in subsequent periods…[4]

Lettsom estimated that smallpox mortality in London was twice that recorded in the Bills of Mortality, 'the generic article convulsions having swallowed up, in his opinion, a large number of smallpox deaths of infants.'[5] However, there is no evidence that the registration of convulsions associated with smallpox changed significantly in the late eighteenth century, but it does mean smallpox statistics must be treated with a degree of caution.

II

Adults living in the hinterland of London greatly feared moving into the city, as revealed by the following account published in 1767 on the impact of inoculation on migration into London:

> Inoculation for the small-pox has so very much prevailed in the country, that thousands and ten thousands have escaped the fatal effects of that distemper in the natural way: but what are the consequences of so good an invention? No sooner are the lower sort recovered, but they aim (the women especially) to get a servitude in London, or to use their own words to better themselves; this is the only objection that can be made to inoculation, and indeed it is one, for before they did not dare to quit the place of their birth for fear of that distemper, so remained honest and useful in the country …[6]

In the south of England smallpox was widely avoided when present in market towns and other places of high visibility,[7] and this may have been one of the reasons why it was a disease of both adults and children in these rural and provincial southern areas.

III

Davenport et.al. have used data from the Stepney's sexton's register to argue that there was increasing endemicization of smallpox in London, but did not provide details of this evidence. In fact, there is no information in the register on children dying under the age of

[3] Razzell, *Conquest*, 137.
[4] Haygarth, *A Sketch*, p. 141.
[5] Creighton, p. 534; Lettsom, *A Letter,* p. 5.
[6] Razzell, *Conquest*, pp. 81, 82.
[7] Ibid, pp. 145, 146.

two before 1774, or any information on age and the child/adult status of smallpox victims in the period 1757-73, a central period for their thesis. The following is an analysis of smallpox burial ages for the post-1774 period when such data is available.

Table 1: Distribution by age of smallpox burials (per cent) in St. Dunstan's Stepney, 1774-1808.[8]

Age Group	Period			
	1774-79	1780-89	1790-99	1800-08
0<1	22.3	21.7	24.2	22.8
1<2	21.8	17.3	17.4	24.4
2<3	18.9	16.8	17.7	16.8
3<4	12.4	14.2	13.7	10.8
4<5	16.2	6.7	9.3	9.2
5<10	9.6	13.0	12.1	10.0
10<20	2.0	2.3	1.6	2.8
20+	2.8	8.1	4.0	3.2
Total number of cases	354	346	322	250

Source: St. Dunstan Stepney sexton's burial register.

There is no significant change in the proportions of infants dying from smallpox, and except some decline in adult smallpox, Table 1 does not support the endemicization thesis.

Additional evidence on age incidence is now available for another London parish. The burial register of St. John's Wapping provides a complete list of the ages of smallpox burials in the period 1763-1802 – with nearly 100% coverage – listing ages to the nearest month, which when analysed yields the following results.

Table 2: Distribution by age of smallpox burials (per cent) in St. John Wapping, 1763-1802.

Age Group	Period				
	1763-67	1768-72	1773-82	1783-92	1793-1802
0<1	19.9	22.1	19.1	20.5	21.2
1<2	15.7	20.0	17.2	27.8	18.6
2<3	18.7	10.0	20.6	15.2	18.6
3<4	8.4	15.0	17.2	9.3	17.8
4<5	9.6	8.6	9.3	7.9	6.8
5<10	9.0	9.3	8.3	7.3	10.2
10<20	3.0	3.6	2.0	2.0	1.7
20+	15.7	11.4	6.4	9.9	5.1
Total number of cases	166	140	204	151	118

Source: St.John Wapping burial register.

There was a long-term fall in the number of adult smallpox burials between 1768-72 and 1793-1802, largely confirming earlier evidence on the subject. There was however no linear

[8] I would like to thank Ramola Davenport for sending me the raw data on which this table is based.

trend in the concentration of smallpox burials amongst infants under the age of one, and no significant change before and after 1770, which the authors argue was the watershed for increasing infectiousness. Overall, Table 2 does not suggest a significant change in the age incidence of children dying from smallpox.

There is other evidence to indicate that smallpox did not become more concentrated in very young infants in other urban areas at the end of the eighteenth century. The burial register of Holy Trinity Whitehaven – a town with a population of 8,712 in 1801 – recorded the ages of smallpox burials in the period 1751-81.[9]

Table 3: Distribution by age of smallpox burials (per cent) in Holy Trinity Whitehaven, 1751-81.

Age Group	*Period*			
	1751-58	1759-68	1769-75	1776-81
0<1	16.0	16.7	7.4	9.2
1<2	19.1	31.7	36.3	36.9
2<3	17.9	22.4	23.0	28.5
3<4	19.1	16.1	20.0	14.6
4<5	11.7	5.6	5.2	5.4
5<10	17.5	5.5	5.9	5.5
10+	2.5	1.9	2.2	0.8
Total number of cases	162	161	135	130

Source: Holy Trinity Whitehaven burial register.

There was a significant decrease in the proportion of young infants under one dying from smallpox between 1759-68 and 1776-81, although this was counter-balanced by an increase in the percentage of children dying aged from one to two between 1751-58 and 1776-81. Table 3 does not indicate an overall increase in infectiousness of smallpox in the period after the 1760s.

The authors have argued that Swedish data that does not refute the endemicization thesis as it covers the period 1776-1805, and their argument is that the concentration of smallpox amongst young infants took place from the 1760s onwards.[10] However, there is evidence that age incidence was constant in Sweden during the period 1756-60 to 1788-92.

Table 4: Age distribution of smallpox mortality (per cent) in Sweden, 1756-1810.

Period	*Age Group*						
	0	1-2	3-4	5-9	10-24	25-49	50+
1756-60	30.3	31.0	18.5	13.9	5.5	0.6	0.2
1788-92	30.5	31.5	19.3	13.4	5.0	0.3	0.1
1806-10	27.3	32.4	18.3	16.0	5.3	0.5	0.3

Source: Skold, The two faces, pp. 102, 106, 120

[9] Holy Trinity Whitehaven burial register.
[10] Davenport et.al., 'Urban inoculation', p. 194, fn. 24.

This data indicates not only that age incidence was constant, but that there was a decline in the proportion of infants dying from smallpox under the age of one between 1788-92 and 1806-10. Table 3 therefore does not indicate an increasing endemicization of smallpox after the 1760s.

In one respect, burials are not a reliable way of measuring the infectiousness of the disease. There were marked variations in case fatality depending on age incidence, so that for example in Whitehaven smallpox mortality was about four times lower amongst children above five as it was in those under the age of two.[11] Fortunately, the Whitehaven Dispensary published figures of the number of smallpox cases as well as the number of deaths in the period 1783-1802,[12] which indicates that smallpox became less frequent amongst infants under the age of two.

Table 5: Distribution by age of smallpox cases (per cent) in the Whitehaven Dispensary,1783-1802.

Age Group	*Period*		
	1783-1787	1787-1795	1795-1803
0 < 2	34.4	24.1	18.8
2 < 5	43.0	54.2	56.5
5 < 10	22.0	18.9	21.7
10+	3.3	2.8	3.5
Total number of cases	363	286	85

Source: Annual reports of the Whitehaven Dispensary, 1783-1804.

Although the data in Table 5 is for a period after the 1760s, the marked fall in the incidence of the disease amongst the 0-2 age group in the period 1783-1802 is not consistent with an increase in the infectiousness of smallpox. There was also a major reduction of disease mortality in 1795-1803, which was almost certainly the result of the practice of inoculation – 1,079 inoculations were carried out in Whitehaven between 1783 and 1796.[13]

Davenport et.al. have produced important reconstitution data for the parish of St. Martin's, which indicate an increasing concentration of smallpox in young children. There are however problems with this evidence, partly revealed by the number of adjustments required to estimate smallpox mortality levels. The overall adjustment to the data approximately doubled mortality in the different periods included in their Table 5, and the adjustments were made 'for missing causes of death and missing infants (presumed exported for burial).'[14] There is however extensive evidence that many of the missing deaths were in fact due to unregistered burials as a result of clerical negligence, with about 40 per cent absent from the London parish registers in the eighteenth century.[15] Additionally, the proportions of burials included in the study are only a minority of total burials – between

[11] Razzell, 'The decline', 1317; Table 1 above.
[12] *A general state of the Whitehaven dispensary*.
[13] Creighton, *A history*, p. 508.
[14] Davenpot et.al., 'Urban inoculation', p. 202.
[15] Razzell, 'Infant mortality in London'; Razzell, *Mortality,* p. 35.

seven and eighteen per cent – and such minorities are not likely to be entirely representative.[16]

IV

The authors present evidence on smallpox mortality using the ratio of smallpox burials to all burials. A problem with this measure is that it does not take into account the marked decline in all-cause infant and child mortality in London and other cities during the second half of the eighteenth century. A reconstitution study of sixteen London parishes indicates that infant mortality fell from 409 per 1000 in 1700-49 to 141 per 1000 in 1800-49.[17] Additionally, the number of children dying under the age of two as a proportion of the number of children baptised in the Bills of Mortality was as follows: 1740-49: 61%; 1750-59: 51%; 1760-69: 33%; 1770-79: 33%; 1780-89: 38%; 1790-99: 26%; 1800-09: 22%; 1810-19: 20%.[18] There is evidence that infant mortality nearly halved in the towns of Norwich, Ipswich, Canterbury and Northampton between the end of the seventeenth and middle of the nineteenth centuries, and this may also have been true of Manchester.[19]

A better measure of mortality is the expression of child burials as a proportion of the number of baptisms, as this includes all children potentially at risk of dying in the early years. It is possible to compare this measure with the results of the reconstitution study carried out by the authors.

Table 6: Child smallpox burial rates measured by reconstitution research and the ratio of burials to baptisms in St. Martin in the Fields.

Period	*Reconstitution research: probability of dying in age interval 0<23 Months, adjusted data*	*Period*	*Smallpox burials <5 years per 1000 baptisms*
1752-66	59.9	1751-70	73
1775-99	79.9	1774-1800	101
1800-12	31.9	1801-12	56

Source: Davenport et.al.,'Urban inoculation', p. 202; St. Martin in the Fields sexton's burial register.

The pattern is very similar in the two sets of data, in spite of slight period and methodological differences. The pattern of mortality of children under ten measured by burial/baptism ratios is also very similar to those for children under five: 1751-70: 86/1000, 1774-1800: 111/1000, 1801-12: 61/1000. As the majority of smallpox burials in London were children under the age of ten, it is appropriate to use the burial/baptism ratio for studying changes in mortality in this age group.

[16] The exact proportions are: 1752-66: 16.3%; 1775-99: 18.2%; 1800-12: 7.3%. I would like to thank Ramola Davenport for providing the raw data on which these calculations are based.
[17] Razzell, *Mortality*, p. 35.
[18] Ibid, p. 38.
[19] Ibid, pp. 34-36

Table 7: Smallpox mortality in St. John Wapping, 1763-1802.

	Period			
	1763-72	1773-82	1783-92	1793-1802
Number of smallpox burials < 10 years	254	187	133	110
Number of baptisms	1530	1657	1493	1316
Smallpox burials <10 years per 1000 baptisms	166	113	89	84

Source: St. John Wapping burial register.

Smallpox mortality approximately halved between 1763-72 and 1793-1802 in Wapping, with most of the reduction occurring before 1792.

By bringing together existing data, we may summarize the history of smallpox mortality of children under of ten in London as follows:

Table 8: Smallpox mortality of children under the age of ten measured by the burial/baptism ratio, London, 1760-1812.[20]

Period	*St. Martin's*	*Wapping*	*Stepney*	*Whitechapel*
1760-69	138/1000	166/1000	-	108/1000
1770-79	114/1000	113/1000	145/1000	62/1000
1780-89	108/1000	89/1000	77/1000	67/1000
1790-99	131/1000	84/1000	63/1000	58/1000
1800-12	64/1000	56/1000	46/1000	62/1000

Source: The parish registers of St. Martin's, Wapping, Stepney and Whitechapel.

Except for St. Martin's, there were significant falls in mortality in all areas in the late eighteenth century, consistent with what is known about the practice of inoculation in London. As we have previously seen, data from the London Bills of Mortality also indicates significant reductions in smallpox mortality during the second half of the eighteenth century – from 137 smallpox burials per 1000 baptisms in 1740-49 to 89 per 1000 in 1790-99.[21] Some of the smallpox burials were of course of adults and children over ten, but the decline of such burials according the parish studies reviewed was on average about 12% in the period between the middle and end of the eighteenth century, whereas the decline of mortality depicted above is of the order of 35%. Some of the reduction of smallpox in children over the age of ten and adults would have been due to inoculation, evidenced by the fact that the London Smallpox Hospital confined its in-patient inoculations to children aged over seven and to adults, who appear to have been the majority of in-patients.[22] The Bills of Mortality data therefore suggests, along with the evidence in Table 8, that there was a significant reduction in smallpox mortality in London during the late eighteenth century.

[20] For purposes of illustration, the figures in Table 8 have been presented by standardized decade. The exact decades are: St. Martin's: 1761-70, 1774-80, 1781-90, 1791-1800, 1801-12; Wapping: 1763-72, 1773-82, 1783-92. 1793-1802, 1803-12; Stepney 1774-79, 1780-89, 1790-99, 1800-08; Whitechapel: 1760-69, 1770-79, 1780-89, 1790-99, 1800-12.

[21] Razzell, 'The decline', 1332.

[22] Ibid, pp. 1323, 1324.

This decline in mortality is particularly impressive given that the virulence of smallpox was increasing at this time, as evidenced by the growth of case-fatality rates in the London Smallpox Hospital.[23] The long-term pattern of disease virulence was summarised by McVail, as follows:

> … natural smallpox gradually became throughout the eighteenth century, and up to the epidemic of 1870-73, a more virulent and fatal disease, its maximum fatality being on a large basis of facts 45 per cent …[24]

Smallpox had killed less than five per cent of children in London during the sixteenth century, and a number of sources indicate that its virulence grew steadily throughout the seventeenth, eighteenth and nineteenth centuries.[25] It is probable that the increases in smallpox mortality in St. Martin in the Fields and Manchester were the result of growing case fatality rates. It is possible that mortality also increased in northern areas where inoculation does not appear to have been so widely practised – although this was not the case in Whitehaven – and further clarification of this issue must depend on future research.

There is however an even more complex issue than the increasing virulence of smallpox, and that is the assumption made by Davenport et.al. that vaccination was introduced at the very beginning of the nineteenth century.

V

There is no statistical data on the relative practice of inoculation and vaccination in London after the discovery of the latter in 1796. However, as we have previously seen, there is extensive anecdotal evidence that inoculation was widely supported and vaccination opposed by the general population in London during the first decade of the nineteenth century and beyond.[26] This was partly because of the foreign nature of the new vaccination with its claimed origin in cowpox, but also because it failed to give the life-long protection provided by inoculation.[27]

In the London Smallpox Hospital, 'the number of vaccinations declined after 1805 from two thousand to sixteen hundred, while inoculations doubled from two to over four thousand five hundred. However … by 1808, vaccination and inoculation were again equally popular.'[28] This suggests that the majority of cases carried out were inoculations, and that vaccination covered less than half of the population during the first decade of the nineteenth century.

There is however a more important problem with the introduction of vaccination, which is the nature and origins of the practice itself.

VI

[23] See Razzell, The decline, p. 1332.
[24] Razzell, *Conquest,* p. 169. See also pp 169-71.
[25] Ibid, 169-179.
[26] Razzell, 'The decline', pp. 1327, 1328.
[27] Razzell, *Edward Jenner's Cowpox Vaccine,* p. 84.
[28] Razzell, 'The decline', p. 1328.

In 1767 J.Z. Holwell published a book on variolation in India, stating that Indian inoculators always used 'matter from the inoculated pustules of the previous year', with the result that 'a few pustules generally appear round the edge of the wound … without a single eruption on any other part of the body.'[29] A number of English inoculators began subsequently to experiment with ways of attenuating the severity of inoculation, and one of the most successful experiments was described by Mudge in 1777:

> Messrs. Longworthy and Arscott, surgeons, in the spring of 1776, inoculated at Plympton … forty patients; of which number, thirty were injected with crude matter from the arm of a young woman [from the site of inoculation], five days after she had been inoculated … though the injection took place, so as to inflame them considerably, and to produce a very large prominent pustule, with matter on it, in each of them, yet not one of them had eruptive fever, or a single subsequent eruption, on any part of the body … it is to be remarked too that the matter which was in those pustules having been used to inoculate others produced on them exactly the same appearances, unattended also with either fever or smallpox.[30]

Mudge rejected the results of this experiment on the grounds that such attenuated inoculation would not guarantee protection against future attacks of smallpox given the mildness of symptoms, a problem that was later to be associated with vaccination. A number of other surgeons carried out similar experiments with mixed results, but not stating clearly what procedures they adopted in selecting the virus.[31] One of the most successful was Dr Adams, physician at the London Smallpox Hospital, who in 1808 attempted to transform smallpox through arm-to-arm inoculation into vaccine:

> By continuing with great caution to inoculate at the hospital from Pearl Small Pox and afterwards by selecting those arms which had the most appearance of CowPox, we had at last succeeded in procuring a succession of arms so nearly resembling the vaccine, that a universal suspicion prevailed amongst parents, that they were deceived by the substitution of one for the other.[32]

Adams was anxious to avoid the appearance of vaccination because of its unpopularity in London at this time, while at the same time creating a safer form of inoculation with less severe results. The essence of the technique was the use of virus from a previous site of inoculation, propagated through arm-to-arm inoculation. Jenner's biographer, John Baron, believed smallpox could be attenuated in this way, quoting Jenner in support of this view:

> After a series of inoculations with true variolous matter it has been often observed that the severity of the symptoms and the number of pustules gradually diminish till only one is to be seen, at the point of insertion … This fact did not escape the observation of Dr Jenner; in reference to which he has remarked in one of his memoranda, 'Here we see the cowpox and the smallpox acting similar parts: and that in either case the virus may steal, as it were, imperceptibly through the constitution, and give no signal of its presence.'[33]

---

[29] Razzell, *Edward Jenner's Cowpox Vaccine*, p. 85.
[30] Razzell, Ibid, p. 87.
[31] Ibid, pp. 88-90.
[32] Ibid, p. 89.
[33] Ibid, p. 91.

This description of the attenuation of smallpox provides a background to a discussion of the origins of Jenner's own stocks of vaccine from 1796 onwards.[34] He himself had been inoculated as a boy in 1756 and went onto successfully to practice Suttonian inoculation for many years before his discovery of vaccination.[35] His initial claims for the value of vaccination were very modest:

> Should it be asked whether this investigation is a matter of mere curiosity, or whether it tends to any beneficial purpose? I should answer, that notwithstanding the happy effects of inoculation, with all the improvements which the practice has received since its first introduction into this country, it not very unfrequently produces deformity of the skin, and sometimes, under the best management, proves fatal.[36]

He was therefore anxious to discover a safer and less severe form of inoculation, and experimented on the 14th May 1796, when he injected James Phipps with cowpox taken from the hand of the milkmaid Sarah Nelmes. After this first trial vaccination, Jenner did not achieve further success until the spring of 1798, when more than thirteen people were vaccinated again with cowpox discovered in the Berkeley area.[37] The clinical reactions at the site of injection were rather severe with 'an extensive erysipelatous inflammation … with some degree of pain', resulting in the application of 'a little mild caustic' to the sites of injection on two of the children vaccinated – the prelude to a series of severe reactions which Jenner recommended should be treated with caustic.[38]

After these initial successes, Jenner lost his stock of vaccine and was unable to supply supporters with virus to carry out vaccinations. Towards the end of January 1799, an outbreak of cowpox was discovered at a London milk farm in Gray's Inn Lane, and William Woodville, physician to the London Smallpox Hospital, collected some cowpox and vaccinated fourteen people with the virus. However, anxious about the effectiveness of vaccination in protecting against smallpox in the London Smallpox Hospital, Woodville then variolated a number of them:

> Among the patients inoculated for the Cow Pox during the first week in which I obtained the matter of this disease, several were so circumstanced as to be afterwards constantly exposed to the Infection of Small Pox. Having no proof that the progress of the infection of the former would supersede that of the latter, I used the precaution to inoculate patients with variolous matter on the fifth day after that taken from the cow.[39]

Six of the ten cases had pustular eruptions strongly resembling smallpox, and of the next five hundred 'vaccinations' carried out by Woodville, nearly two-thirds had pustular eruptions other than at the site of injection, very similar to the results of the old inoculation.[40] These pustular eruptions diminished through subsequent arm-to-arm inoculation, particularly when taken from the site of a previous injection, until eventually

---

[34] Davenport et.al. mistakenly state that Jenner's first name was William, but it was in fact Edward. Davenport et.al., 'Urban inoculation', p.189.
[35] Razzell, *The Conquest,* pp. 23, 93, 94
[36] Ibid, p. 93.
[37] Razzell, *Edward Jenner's Cowpox Vaccine.*
[38] Ibid, pp. 9-11.
[39] Ibid, p. 16.
[40] Ibid, 16, 17.

these 'vaccinations' resulted in just a local vesicle at the site of injection, resembling classical vaccination.[41] This stock of 'vaccine' was sent out widely by Woodville and colleagues and eventually acquired the reputation of being the 'world's lymph'.[42]

Jenner had lost his own cowpox vaccine and was supplied on the 15th February 1799 with virus taken Woodville's stock of 'vaccine'. According to Woodville, 'the matter sent was taken from the arm of Ann Bumpus, who had three hundred and ten pustules, all of which suppurated.'[43] Jenner had received this virus on a dried thread from Pearson, and described the resulting inoculations as follows:

> Dr Pearson … was dispersing threads embued in the virus to various places in our own country, and to many parts of the Continent … in many places where the threads were sent a disease like mild smallpox frequently appeared; yet, curious to relate, the matter, after it had been used six or seven months, gave up the variolous character entirely and assumed the vaccine; the pustules declined more and more, and at length became extinct. I made a few experiments myself with this matter, and I saw a few pustules on my first patients; but in my subsequent inoculations there were none.[44]

This process of attenuation of smallpox virus through arm-to-arm transmission – using sites of previous injections – is similar to that achieved by Longworthy and Arscott in their earlier trials with inoculation. However, in the earlier stages of attenuation, there were occasional severe reactions which in some cases led to minor smallpox epidemics.

On December 11th 1799, Dr. Andre of Petworth in Sussex, wrote the following account of the 'vaccine' which had been sent to him by Pearson for his practice of vaccination:

> The matter sent from Brighton to Petworth produced a disease in every shape resembling smallpox: the time of sickening, the symptoms, the eruptions and their maturation were the same. The number inoculated was fourteen. Three of these were children at the breast; the number of eruptions was from three to twelve. The ages of the remaining eleven were from three to fourteen, and the number of eruptions from fifty to a thousand.[45]

An elderly woman visiting the house in which the children were isolated caught smallpox, infected her husband, and died soon afterwards of the disease.[46] This was not the only case of an epidemic being caused by the use of the new 'vaccine'. At the beginning of July 1800, Dr Waterhouse of Marblehead near Boston in the United States, received vaccine from Haygarth of Bath, which had been 'procured from Dr Jenner's stock by Mr. Creaser.'[47] Waterhouse gave the following description of two of the first cases he 'vaccinated' with this virus:

> They both went through the disease with … symptoms … very similar to those of the lighter kind from the inoculation for the smallpox … The striking similarity of symptoms has induced some

[41] Ibid, p. 42-44.
[42] Ibid, pp. 8, 32.
[43] Ibid, p. 22.
[44] Ibid, pp. 7, 8.
[45] Ibid, p.7
[46] Ibid.
[47] Ibid, p. 65.

practitioners in this country … to conclude, that the kine-pox [cowpox] was only a variety of the smallpox.[48]

The result of these inoculations was an outbreak of epidemic smallpox in Marblehead.[49] Waterhouse attempted to justify his practice of vaccination by writing that 'the like occurrences took place in Geneva, and at several places in England, especially at Petworth, where the virus gave a spurious disease … the effects formed a counterpart to the disasters at Marblehead.'[50] He further noted that 'if we are to judge the force of the disease by the number of pustules, it certainly becomes milder as it recedes from the cow', confirming the progressive attenuation of inoculation by arm to arm transfer.

There is some evidence that Jenner found other stocks of cowpox for the creation of vaccines,[51] but it is unclear whether these were used widely in England. It appears that Woodville's 'vaccine' continued to be used in London and elsewhere until the middle of the nineteenth century, and it was replaced because it became less effective due to its progressive attenuation.[52]

VII

The nature of the vaccinia virus has been clarified by laboratory tests, including DNA analysis. Derek Baxby, the leading authority on the microbiology of poxviruses, has concluded that vaccinia 'could not have been derived from cowpox or smallpox viruses during the last 200 years.'[53] He has further concluded that 'in the case of cowpox, bovine infection is very rare and the domestic cat is the most commonly detected victim. The likely reservoir hosts are rodents, and include … bank voles and woodmice in Britain.'[54]

It is for this reason that Jenner and others probably found it very difficult to locate cowpox. In the nineteenth century in order to create stocks of vaccine a number surgeons resorted to the inoculation of cows with smallpox.[55] However, modern laboratory research has established that it is impossible to transform smallpox into cowpox,[56] and as Crookshank observed in 1889, 'those who have been have been inoculated with … "variola-vaccine" lymph have not, in the true sense of the word, been vaccinated, they have not been Cow Poxed, but they have been variolated.'[57] The inoculation of cows with smallpox was widely practiced in India in the nineteenth century, and as Bhattacharya has written: 'Cowpox was rare in India – vaccine was often produced by using smallpox scabs to infect animals (not just cows) and the resultant pox pustules were then widely used as a source of vaccine.'[58]

---

[48] Ibid, p. 65.
[49] Razzell, *Conquest,* p. 47; Razzell, *Edward Jenner's Cowpox Vaccine*, pp. 68, 69.
[50] Razzell, *Edwards Jenner's Cowpox Vaccine*, p. 73.
[51] Ibid, pp. 33, 38
[52] Ibid, 40, 84.
[53] Baxby, 'Poxviruses, p. 369; Baxby, *Jenner's Smallpox Vaccine.*
[54] Baxby, 'Poxviruses', p. 377.
[55] Razzell, *Edward Jenner's Cowpox Vaccine*, pp, 98, 99.
[56] Herlich et.al., 'Experimental studies'.
[57] Crookshank, *History*, p. 301.
[58] Personal communication from Sanjoy Bhattacharya. See also Bhattacharya, *Expunging variola*.

The origin of the Lister Institute stock of vaccine in England is unknown, but there is some evidence that it was sent from Cologne some time after 1871, and is reported to have been taken from the arm of a Prussian soldier suffering from smallpox.[59]

VIII

Davenport , Boulton and Schwarz have raised some fundamental issues about the history of smallpox in the late eighteenth and early nineteenth century. The present commentary has ranged widely in order to examine some of the implications of their arguments, but the balance the evidence does not point to the increasing infectiousness of the disease. The data reviewed suggests that inoculation in all its forms reduced disease mortality both before and after the end of the eighteenth century. Vaccination – whether derived from smallpox or not – had a significant influence on the popularity of the practice, particularly in areas where the smallpox was endemic, affecting mainly young children.

Parents had feared the disease, and although not entirely fatalistic, had often been unwilling to expose their children to a known risk associated with the old inoculation, but were willing to embrace the new more attenuated 'vaccination' because of its very safe outcome. However, the latter did not give the life-long protection associated with variolation, and there were instances of subsequent attacks after vaccination which sometimes resulted in death.

Inoculation had been practised particularly widely in the south of England, where both adults and children were vulnerable to smallpox. When the disease arrived in a parish it created a panic response, which created the conditions for general inoculations. However, as the population became familiar with the benefits of Suttonian inoculation, urban areas like London and Whitehaven did resort widely to the practice, which began to diminish mortality.

Without inoculation and the more attenuated vaccination, England and many other countries would have been decimated by smallpox, with perhaps up to forty-five per cent of the population dying from the disease by the late nineteenth century, equivalent to a new bubonic plague. Whatever the exact relationship between variolation and vaccination, this stands out as a major achievement of preventative medicine.

[59] Baxby, *Jenner's Smallpox Vaccine*, p. 181.

Footnote references

Annual reports of the Whitehaven Dispensary, 1783-1804. (Wellcome Trust Library).

Baxby, D., *Jenner's smallpox vaccine: the riddle of vaccinia virus and its origins* (1981).

Baxby, D. 'Poxviruses', in L. Collier et. al., *Topley and Wilson's microbiology and microbial infections, volume 1 virology, chapter 21*. (1998)

Bhattacharya, S., *Expunging variola: the control and eradication of smallpox in India* (2006).

Creighton, C., *A history of epidemics in Britain,* 2 (1965).

Crookshank, E.M., *History and pathology of vaccination*, 1 (1889).

Davenport, R.J., Schwarz, L., and Boulton, J., 'The decline of adult smallpox in eighteenth-century London', *Economic History Review*, 64 (2011), pp. 1289-314.

Davenport, R. J., Boulton, J., and Schwraz, L., 'Urban inoculation and the decline of smallpox mortality in eighteenth century cities – a reply to Razzell', *Economic History Review*, 69 (2016), pp. 188-214.

Herrlich, A. et.al., 'Experimental studies on transforming variola virus into vaccinia virus', *Archiv fur die gesamte virusforschung*, 12 (1963).

Holy Trinity Whitehaven parish register, Whitehaven Local History Archive.

Lettsom, J.C., *A letter to Sir Robert Baker and George Stacpoole Esq.upong general inoculation.* (1778).

Razzell, P.E., *Edward Jenner's cowpox vaccine: the history of a medical myth* (1977).

Razzell, P. E., *The conquest of smallpox: the impact of inoculation on smallpox mortality in eighteenth century Britain* (2003).

Razzell, P. E., 'The decline of adult smallpox in eighteenth-century London: a commentary', *Economic History Review*, 64 (2011), pp. 1315-335.

Razzell, P.E., *Mortality, marriage and population growth in England, 1550-1850* (2016).

Razzell, P.E. and Spence, C. 'The history of infant, child and adult mortality in London, 1550-1850', *The London Journal,* 32 (2007).

Razzell, P.E., 'Infant mortality in London, 1550-1850: a methodological study'. *Local Population Studies*, 87 (2011).

Skold, P., *The two faces of smallpox* (1996).

St. Dunstan Stepney sexton's burial register, Ancestry online.

St. John Wapping burial register, Ancestry online.

St. Martin in the Fields sexton's burial register, Ancestry online.

St. Mary Whitechapel burial register, Ancestry online.

Inoculation and the Decline of Smallpox Mortality in London during the Late Eighteenth and Early Nineteenth Centuries.

Summary

Davenport, Boulton and Schwarz have presented evidence for two London parishes and for Manchester to show that there was an increasing concentration of smallpox amongst young infants, arguing that this resulted from a growth in the disease's infectiousness, although this has been contested by Razzell.[1] The aim of this paper is to summarize all the existing evidence, as well as data on two other London parishes and other areas in England. The overall evidence suggests that there was no such concentration of smallpox amongst young infants. There is however agreement that adult smallpox burials largely disappeared in London at the end of the eighteenth century. It is argued here that these changes were due to the practice of inoculation (variolation) in London and its rural hinterland. It is also concluded that early vaccination was a form of attenuated inoculation, and that it was inoculation rather than classical vaccination which was responsible for the decline of smallpox mortality in London at the end of the eighteenth and beginning of the nineteenth century.

Keywords: smallpox, mortality, inoculation, London, vaccination.

Introduction

There were difficulties in the registration of smallpox in the eighteenth century, and as Dr Percival wrote in 1758:

> A considerable number of those who die of the natural disease [of smallpox], before the expulsion of the variolous eruption, are infants or very young children … Hence the convulsive paroxysms which often precede the appearance of the pustules … are always alarming, and when they happen to very young infants are frequently fatal.[23]

[1] R.J. Davenport, Leonard Schwarz and Jeremy Boutlton, 'The Decline of Adult Smallpox in Eighteenth Century London', *Economic History Review*, 64 (2011), 1289-1314; Peter Razzell, 'The Decline of Adult Smallpox in Eighteenth-Century London: a Commentary', *Economic History Review* 64 (2011), 1315-1335; R.J. Davenport, Jeremy Boulton and Leonard Schwarz, 'Urban Inoculation and the Decline of Smallpox Mortality in Eighteenth Century Cities – a Reply to Razzell', *Economic History Review*, 69 (2016), 188-214.

[2] Peter Razzell, *The Conquest of Smallpox: the Impact of Inoculation on Smallpox Mortality in Eighteenth Century Britain* (London: Caliban Books, 2003), 137.

Subsequently in 1793 Haygarth confirmed the importance of convulsions resulting from smallpox, and the way they distorted the statistics of mortality:

> The disease most fatal to infants is convulsions, arising from various causes; one of them is the small-pox. The two circumstances will explain the reason why, under one year old, the proportion of deaths by the small-pox is less than in subsequent periods…[4]

Lettsom estimated that smallpox mortality in London was twice that recorded in the Bills of Mortality, 'the generic article convulsions having swallowed up, in his opinion, a large number of smallpox deaths of infants.'[5] However, there is no evidence that the registration of convulsions associated with smallpox changed significantly in the late eighteenth century, but it does mean smallpox statistics must be treated with a degree of caution.

Migration In To London

Adults living in the hinterland of London greatly feared moving into the city, as revealed by the following account published in 1767 on the impact of inoculation on migration into London:

> Inoculation for the small-pox has so very much prevailed in the country, that thousands and ten thousands have escaped the fatal effects of that distemper in the natural way: but what are the consequences of so good an invention? No sooner are the lower sort recovered, but they aim (the women especially) to get a servitude in London, or to use their own words to better themselves; this is the only objection that can be made to inoculation, and indeed it is one, for before they did not dare to quit the place of their birth for fear of that distemper, so remained honest and useful in the country …[6]

The movement of people into London who were exempt from smallpox as a result of inoculation had a significant effect on mortality in the metropolis. In 1778 Dimsdale predicted the effect as follows:

> ... it will seem extremely probable, that the Small Pox is already arrived at its utmost pitch in respect of deaths within the Bills of Mortality, and that we can expect an abatement on this head, for the obvious reason, that one source will be stopped by the extensive practice of general Inoculations in the country, which have prevailed in

---

[3] Peter Razzell, *The Conquest of Smallpox: the Impact of Inoculation on Smallpox Mortality in Eighteenth Century Britain* (London: Caliban Books, 2003), 137.
[4] J. Haygarth, *A Sketch of a Plan to Exterminate the Casual Smallpox* (London: 1793), 141.
[5] Charles Creighton, *A History of Epidemics in Britian*, 2 (Cambridge: C.U.P.,1965) 534; J.C. Lettsom, *A Letter to Sir Robert Barker and George Stacpoole Esq, upon General Inoculation* (London: 1778),5.
[6] Peter Razzell, *The Conquest of Smallpox* (London: Caliban Books, 2003), 81, 82.

> a remarkable manner within the last two years in the counties of Bedford, Bucks, Herts, and Cambridge, and others contiguous to London; and these patients have been generally such inferior persons as may be supposed to supply London. To such an extent has this practice been carried, that I imagine the number must amount to many thousands...[7]

The age profile of these immigrants is suggested by the proportion of adults over the age of twenty-one dying from smallpox in these rural hinterlands.

Table 1: The Proportion of Adult Smallpox Deaths in the South of England.[8]

Place	*Period*	*Proportion of Adult Smallpox Deaths*
Basingstoke, Hampshire	1675-1803	56%
Riseley, Bedfordshire	1690-1742	44%
Godalming, Surrey	1701-23	50%
Calne, Wiltshire	1704-58	39%
Tenterden, Kent	1712-41	78%
Banbury, Oxfordshire	1718-19	40%
Breamore, Hampshire	1720-1803	83%
Aynho, Northamptonshire	1723-24	69%
Great Shefford, Berkshire	1751-67	34%
Rayleigh, Essex	1753	72%
Southampton, Hampshire	1753-61	54%
Bury St. Edmunds, Suffolk	1756-57	42%
Burford, Oxfordshire	1758	46%
Cuxham, Oxfordshire	1772	75%
Horton Kerbie Kent	1772-1801	100%
Thanet, Kent	1774-89	2%
Sutton Courtenay, Berkshire	1782-1811	67%

About a half of all smallpox deaths in the south of England were of adults. The disease was widely avoided when present in market towns and other places of high visibility in these areas,[9] and this may have been one of the reasons why it was a disease of both adults and children in these rural and provincial southern districts.

The practice of general inoculations confirms the age profile of smallpox in the south. For example, in Diss Norfolk in 1784 the people inoculated ranged from 'one month to between eighty and ninety years'; in Brighton Sussex in 1786 'One to Near Four Score

[7] Thomas Dimsdale, *Observations on the Introduction of the Plan of the Dispensary for General Inoculation* (London: W.Owen, 1778), 125, 126.
[8] Razzell, *The Conquest of Smallpox*, xii, xiii.
[9] *Ibid*, 145, 146.

Years'; in Weston Norfolk in 1788 'old folks, and even women with child, have been inoculated'; and in Dursley, Gloucestershire in 1797 the inoculated were 'of all ages, from a fortnight old to seventy years.'[10] Likewise, many members of the militia and the army in the South of England were inoculated in the 1790s, confirming the presence of smallpox amongst adults at this time.[11]

These populations were of all ages, and formed the basis of the migrants entering London at the end of the eighteenth century. After they had been inoculated they were exempt from the disease, partly accounting for the disappearance of adult smallpox deaths in the metropolis during this period.

Age Profile of Smallpox Deaths in London and Manchester.

Davenport et.al. have used data from the St. Martin's Burial Register and Stepney's Sexton's Register to argue that there was increasing endemicization of smallpox in London. Both registers suffer from poor registration. In St. Martin's there was a gap between 1766 and 1775, an important period for the author's thesis on increasing infectiousness. In Stepney's register, there was no information on children dying under the age of two before 1774, or any information age and the child/adult status of smallpox victims in the period 1757-73, a central period for their argument. The following is an analysis of smallpox burial ages in Stepney for the post-1774 period when such data is available.

Table 2: Distribution by Age of Smallpox Burials (Per Cent) in St. Dunstan's Stepney, 1774-1808.[12]

Age Group	Period			
	1774-79	1780-89	1790-99	1800-08
≤1	22.3	21.7	24.2	22.8
≤2	21.8	17.3	17.4	24.4
≤3	18.9	16.8	17.7	16.8
≤4	12.4	14.2	13.7	10.8
≤5	16.2	6.7	9.3	9.2
≤10	9.6	13.0	12.1	10.0
0<20	2.0	2.3	1.6	2.8
0+	2.8	8.1	4.0	3.2
Total Number of Cases	354	346	322	250

There is no significant change in the proportions of infants dying from smallpox, and except some decline in adult smallpox, Table 2 does not support the endemicization

[10] *Ibid*, 118, 122.
[11] Razzell, 'The decline', 1319, 1320.
[12] The source of this table is the St. Dunstan Stepney Sexton's Burial Register.

thesis. Data for another London parish with continuous data from 1760 to 1812 – St. Mary Whitechapel – also shows no increase in infant smallpox burials, although there was a significant fall in adult burials.[13]

Additional evidence on age incidence is now available for another London parish. The burial register of St. John's Wapping provides a complete list of the ages of smallpox burials in the period 1763-1802 – with nearly 100% coverage – listing ages to the nearest month, which when analysed yields the following results.

Table 3: Distribution by Age of Smallpox Burials (Per Cent) in St. John Wapping, 1763-1802.[14]

Age Group	Period				
	1763-67	1768-72	1773-82	1783-92	1793-1802
≤1	19.9	22.1	9.1	0.5	1.2
≤2	15.7	20.0	7.2	7.8	3.6
≤3	18.7	10.0	0.6	5.2	3.6
≤4	8.4	15.0	7.2	.3	7.8
≤5	9.6	8.6	.3	.9	.8
≤10	9.0	9.3	.3	.3	0.2
0<20	3.0	3.6	.0	.0	.7
0+	15.7	11.4	.4	.9	.1
Total Number of Cases	166	140	04	51	18

There was a long-term fall in the number of adult smallpox burials between 1768-72 and 1793-1802, largely confirming earlier evidence on the subject. There was however no linear trend in the concentration of smallpox burials amongst infants under the age of one, and no significant change before and after 1770, which the authors argue was the watershed for increasing infectiousness. Overall, Table 3 does not suggest a significant change in the age incidence of children dying from smallpox, although it confirms the sharp decline in adult burials between 1763 and 1802.

Davenport et.al. produce evidence to show that there was increasing concentration of smallpox deaths in infants under the age of one in St. Marys, St Denys and St. George Collegiate Church Manchester. Their figures are as follows: 1753-61: 18.9%; 1772-8: 32.7%; 1785-91: 29.2%; 1803-7: 32.3%.[15] There is a sharp rise between 1753-61 and 1785-91, and after that latter period the proportion of young infants dying of smallpox remains stable. It is possible that the increase between 1753-61 and 1772-8 is a result of growing mortality due to the increasing virulence of the disease, as the disease was

[13] Razzell, 'The decline', 1316.
[14] The source for this table is the St. John Wapping Burial Register. I would like to thank Ramola Davenport for sending me the raw data on which this table is based.
[15] 'Davenport et.al., 'Urban inoculation', 195.

particularly lethal to young infants.[16] The authors also produce figures for St. John Deansgate Manchester which show no long-term increase in infectiousness – from 23.4% in 1769-99 to 22.9% in 1800-12.[17]

There is other evidence to indicate that smallpox did not become more concentrated in very young infants in other urban areas at the end of the eighteenth century. The burial register of Holy Trinity Whitehaven – a town with a population of 8,712 in 1801 – recorded the ages of smallpox burials in the period 1751-81.

Table 4: Distribution by Age of Smallpox Burials (per cent) in Holy Trinity Whitehaven, 1751-81. [18]

ge Group	*eriod*			
	751-58	759-68	769-75	776-81
≤1	6.0	6.7	.4	.2
≤2	9.1	1.7	6.3	6.9
≤3	7.9	2.4	3.0	3.5
≤4	9.1	6.1	0.0	4.6
≤5	1.7	.6	.2	.4
≤10	7.5	.5	.9	.5
0+	.5	.9	.2	.8
Total number of cases	62	61	35	30

There was a significant decrease in the proportion of young infants under one dying from smallpox between 1759-68 and 1776-81, although this was counter-balanced by an increase in the percentage of children dying aged from one to two between 1751-58 and 1776-81. Table 4 does not indicate an overall increase in infectiousness of smallpox in the period after the 1760s.

The authors have argued that Swedish data that does not refute the endemicization thesis as it covers the period 1776-1805, and their argument is that the concentration of smallpox amongst young infants took place from the 1760s onwards.[19] However, there is evidence that age incidence was constant in Sweden during the period 1756-60 to 1788-92.

[16] For growing mortality in Manchester see Davenport et.al., 'Urban inoculation', 199;for increasing virulence see Razzell, *The Conquest*, 175-179; for case-fatality rates amongst children see *Ibid*, xviii.
[17] Davenport et.al., 'Urban inoculation', 195.
[18] The source for this table is the Holy Trinity Whitehaven Burial Register.

[19] Davenport et.al., 'Urban Inoculation', 194, fn. 24.

Table 5: Age Distribution of Smallpox Mortality (per cent) in Sweden, 1756-1810.[20]

Period	*Age Group*						
	0	1-2	3-4	5-9	10-24	25-49	50+
1756-60	30.3	31.0	18.5	13.9	5.5	0.6	0.2
1788-92	30.5	31.5	19.3	13.4	5.0	0.3	0.1
1806-10	27.3	32.4	18.3	16.0	5.3	0.5	0.3

This data indicates not only that age incidence was constant, but that there was a decline in the proportion of infants dying from smallpox under the age of one between 1788-92 and 1806-10. Table 5 therefore does not indicate an increasing endemicization of smallpox after the 1760s.

In one respect, burials are not a reliable way of measuring the infectiousness of the disease. There were marked variations in case fatality depending on age incidence, so that for example in Whitehaven smallpox mortality was about four times lower amongst children above five as it was in those under the age of two.[21] Fortunately, the Whitehaven Dispensary published figures of the number of smallpox cases as well as the number of deaths in the period 1783-1802, which indicates that smallpox became less frequent amongst infants under the age of two.

Table 6: Distribution by Age of Smallpox Cases (Per Cent) in the Whitehaven Dispensary,1783-1802.[22]

ge Group	*eriod*		
	783-1787	787-1795	795-1803
< 2	4.4	4.1	8.8
< 5	3.0	4.2	6.5
< 10	2.0	8.9	1.7
0+	.3	.8	.5
Total Number of Cases	63	86	5

Although the data in Table 6 is for a period after the 1760s, the marked fall in the incidence of the disease amongst the 0-2 age group in the period 1783-1802 is not consistent with an increase in the infectiousness of smallpox. There was also a major reduction of disease mortality in 1795-1803, which was almost certainly the result of the practice of inoculation – 1,079 inoculations were carried out in Whitehaven between 1783 and 1796.[23]

[20] The source of this table is from P. Skold, *The Two Faces of Smallpox* (Umea: The Demographic Data Base1996), 102, 106, 120

[21] Razzell, 'The Decline', 1317.

[22] Annual Reports of the Whitehaven Dispensary, 1783-1804 (Wellcome Trust Library).

[23] Creighton, *A History*, 508.

Davenport et.al. have produced important reconstitution data for the London parish of St. Martin's, which indicate an increasing concentration of smallpox in young children. There are however problems with this evidence, partly revealed by the number of adjustments required to estimate smallpox mortality levels. The overall adjustment to the data approximately doubled mortality in the different periods included in their Table 5, and the adjustments were made 'for missing causes of death and missing infants (presumed exported for burial).'[24] There is however extensive evidence that many of the missing deaths were in fact due to unregistered burials as a result of clerical negligence, with about 40 per cent absent from the London parish registers in the eighteenth century.[25] Additionally, the proportions of burials included in the study are only a minority of total burials – between seven and eighteen per cent – and such minorities are not likely to be entirely representative.[26]

Smallpox Mortality in London

The authors present evidence on smallpox mortality using the ratio of smallpox burials to all burials. A problem with this measure is that it does not take into account the marked decline in all-cause infant and child mortality in London and other cities during the second half of the eighteenth century. A reconstitution study of sixteen London parishes indicates that infant mortality fell from 409 per 1000 in 1700-49 to 141 per 1000 in 1800-49.[27]

Additionally, the number of children dying under the age of two as a proportion of the number of children baptised in the Bills of Mortality was as follows: 1740-49: 61%; 1750-59: 51%; 1760-69: 33%; 1770-79: 33%; 1780-89: 38%; 1790-99: 26%; 1800-09: 22%; 1810-19: 20%.[28] There is evidence that infant mortality nearly halved in the towns of Norwich, Ipswich, Canterbury and Northampton between the end of the seventeenth and middle of the nineteenth centuries, and this may also have been true of Manchester, which is a town included in Davenport et.al.'s analysis of smallpox mortality.[29]

A better measure of mortality is the expression of child burials as a proportion of the number of baptisms, as this includes all children potentially at risk of dying in the early years. It is possible to compare this measure with the results of the reconstitution study carried out by the authors.

[24] Davenport et.al., 'Urban inoculation', 202.
[25] Peter Razzell, 'Infant Mortality in London, 1550-1850: a Methodological Study', *Local Population Studies, 87 (2011)*; Peter Razzell, *Mortality Marriage and Population Growth in England, 1550-1850* (London: Caliban Books, 2016), 35.
[26] The exact proportions are: 1752-66: 16.3%; 1775-99: 18.2%; 1800-12: 7.3%.
[27] Razzell, *Mortality*, 35.
[28] *Ibid*, 38.
[29] *Ibid,* 34-36.

Table 7: Child Smallpox Burial Rates Measured by Reconstitution Research and the Ratio of Burials to Baptisms in St. Martin in the Fields.[30]

Period	*Reconstitution Research: Probability of Dying in Age Interval 0<23 Months, Adjusted Data*	*Period*	*Smallpox Burials <5 Years per 1000 Baptisms*
1752-66	59.9	1751-70	73
1775-99	79.9	1774-1800	101
1800-12	31.9	1801-12	56

The pattern is very similar in the two sets of data, in spite of slight period and methodological differences. The pattern of mortality of children under ten measured by burial/baptism ratios is also very similar to those for children under five: 1751-70: 86/1000, 1774-1800: 111/1000, 1801-12: 61/1000. As the majority of smallpox burials in London were children under the age of ten, it is appropriate to use the burial/baptism ratio for studying changes in mortality in this age group.

Table 8: Smallpox Mortality in St. John Wapping, 1763-1802.[31]

	Period			
	1763-72	1773-82	1783-92	1793-1802
Number of Smallpox Burials < 10 years	254	187	133	110
Number of Baptisms	1530	1657	1493	1316
Smallpox Burials <10 years per 1000 Baptisms	166	113	89	84

Smallpox mortality approximately halved between 1763-72 and 1793-1802 in Wapping, with most of the reduction occurring before 1792.

By bringing together existing data, we may summarize the history of smallpox mortality of children under of ten years in London as follows:

[30] Source: Davenport et.al.,'Urban Inoculation', 202; St. Martin in the Fields Sexton's Parish Register.
[31] Source: St. John Wapping Parish Register.

Table 9: Smallpox Mortality of Children under the Age of Ten Measured by the Burial/Baptism Ratio, London, 1760-1812.[32]

Period	*St. Martin's*	*Wapping*	*Stepney*	*Whitechapel*
1760-69	138/1000	166/1000	-	108/1000
1770-79	114/1000	113/1000	145/1000	62/1000
1780-89	108/1000	89/1000	77/1000	67/1000
1790-99	131/1000	84/1000	63/1000	58/1000
1800-12	64/1000	56/1000	46/1000	62/1000

Except for St. Martin's, there were significant falls in mortality in all areas in the late eighteenth century, consistent with what is known about the practice of inoculation in London. As we have previously seen, data from the London Bills of Mortality also indicates significant reductions in smallpox mortality during the second half of the eighteenth century – from 137 smallpox burials per 1000 baptisms in 1740-49 to 89 per 1000 in 1790-99.[33] Some of the smallpox burials were of course of adults and children over ten, but the decline of such burials according the parish studies reviewed was on average about 12% in the period between the middle and end of the eighteenth century, whereas the decline of mortality depicted above is of the order of 35%. Some of the reduction of smallpox in children over the age of ten and adults would have been due to inoculation in London, evidenced by the fact that the London Smallpox Hospital confined its in-patient inoculations to children aged over seven and to adults, who appear to have been the majority of in-patients.[34] The Bills of Mortality data therefore suggests, along with the evidence in Table 9, that there was a significant reduction in smallpox mortality in London during the late eighteenth century. It took many years before inoculation had been practised widely in London, but by the end of the eighteenth century it had become very popular in the metropolis.[35]

This decline in mortality is particularly impressive given that the virulence of smallpox was increasing at this time, as evidenced by the growth of case-fatality rates in the London Smallpox Hospital.[36] The long-term pattern of disease virulence was summarised by McVail, as follows:

[32] Source: The parish registers of St. Martin's, Wapping, Stepney and Whitechapel. For purposes of illustration, the figures in Table 9 have been presented by standardized decade. The exact decades are: St. Martin's: 1761-70, 1774-80, 1781-90, 1791-1800, 1801-12; Wapping: 1763-72, 1773-82, 1783-92. 1793-1802, 1803-12; Stepney 1774-79, 1780-89, 1790-99, 1800-08; Whitechapel: 1760-69,1770-79, 1780-89, 1790-99, 1800-12.
[33] Razzell, 'The decline',1332.
[34] *Ibid*, 1323,1324.
[35] For etailed evidence on the practice of inoculation in London in the late eighteenth and rearly nineteenth century see *Ibid*, 1320-1331.
[36] See Razzell, 'The decline', 1332.

> … natural smallpox gradually became throughout the eighteenth century, and up to the epidemic of 1870-73, a more virulent and fatal disease, its maximum fatality being on a large basis of facts 45 per cent …[37]

Smallpox had killed less than five per cent of children in London during the sixteenth century, and a number of sources indicate that its virulence grew steadily throughout the seventeenth, eighteenth and nineteenth centuries.[38] It is probable that the increases in smallpox mortality in St. Martin in the Fields and Manchester were the result of growing case fatality rates. It is possible that mortality also increased in northern areas where inoculation does not appear to have been so widely practised – although this was not the case in Whitehaven – and further clarification of this issue must depend on future research.

There is however an even more complex issue than the increasing virulence of smallpox, and that is the assumption made by Davenport et.al. that vaccination was introduced at the very beginning of the nineteenth century.

Inoculation and Vaccination in the Metropolis

There is no statistical data on the relative practice of inoculation and vaccination in London after the discovery of the latter in 1796. However, as has previously been seen, there is extensive anecdotal evidence that inoculation was widely supported and vaccination opposed by the general population in London during the first decade of the nineteenth century and beyond.[39] In a letter to Lettsom, dated July 1807, Jenner wrote: 'You will be sorry to hear the result of my interview with the Minister, Mr Perceval. I solicited ... whether it was the intention of government to give check to the licentious manner in which small-pox inoculation is at this time conducted in the metropolis ... [associated with] the capricious and prejudices of the misguided poor ... [40] Murray pointed out in 1808 that these inoculations were carried out 'in every street, court and alley, in the metropolis.'[41] This was partly because of the foreign nature of the new vaccination with its claimed origin in cowpox, but also because it failed to give the life-long protection provided by inoculation.[42]

In the London Smallpox Hospital, 'the number of vaccinations declined after 1805 from two thousand to sixteen hundred, while inoculations doubled from two to over four thousand five hundred. However … by 1808, vaccination and inoculation were again

---

[37] Razzell, *The Conquest,*169. See also 170-71.
[38] *Ibid*, 169-179.
[39] Razzell, 'The decline', 1327, 1328.
[40] W.A. Barron, 'Gleanings from Sussex Archives: Brighton and the Smallpox', *The Sussex County Magazine,* 69, 70.
[41] C. Murray, *An Answer to Mr Highmore's Objections to the Bill before Parliament to Prevent the Spreading of Infection of the Smallpox* (London: 1808), 3.
[42] Peter Razzell, *Edward Jenner's Cowpox Vaccine: the History of a Medical Myth* (Firle: Caliban Books*,* 1980*),* 84.

equally popular.'[43] This suggests that the majority of cases carried out were inoculations, and that vaccination covered less than half of the population during the first decade of the nineteenth century.

There is however a more important problem with the introduction of vaccination, which is the nature and origins of the practice itself.

The Nature and Origins of Early Vaccination

In 1767 J.Z. Holwell published a book on variolation in India, stating that Indian inoculators always used 'matter from the inoculated pustules of the previous year', with the result that 'a few pustules generally appear round the edge of the wound … without a single eruption on any other part of the body.'[44] A number of English inoculators began subsequently to experiment with ways of attenuating the severity of inoculation, and one of the most successful experiments was described by Mudge in 1777:

> Messrs. Longworthy and Arscott, surgeons, in the spring of 1776, inoculated at Plympton … forty patients; of which number, thirty were injected with crude matter from the arm of a young woman [from the site of inoculation], five days after she had been inoculated … though the injection took place, so as to inflame them considerably, and to produce a very large prominent pustule, with matter on it, in each of them, yet not one of them had eruptive fever, or a single subsequent eruption, on any part of the body … it is to be remarked too that the matter which was in those pustules having been used to inoculate others produced on them exactly the same appearances, unattended also with either fever or smallpox.[45]

Mudge rejected the results of this experiment on the grounds that such attenuated inoculation would not guarantee protection against future attacks of smallpox given the mildness of symptoms, a problem that was later to be associated with vaccination. A number of other surgeons carried out similar experiments with mixed results, but not stating clearly what procedures they adopted in selecting the virus.[46] One of the most successful was Dr Adams, physician at the London Smallpox Hospital, who in 1808 attempted to transform smallpox through arm-to-arm inoculation into vaccine:

> By continuing with great caution to inoculate at the hospital from Pearl Small Pox and afterwards by selecting those arms which had the most appearance of CowPox, we had at last succeeded in procuring a succession of arms so nearly resembling the vaccine, that a universal suspicion prevailed amongst parents, that they were deceived by the substitution of one for the other.[47]

---

[43] Razzell, 'The decline',1328.
[44] Razzell, *Edward Jenner's Cowpox Vaccine*, 85.
[45] *Ibid,* 87.
[46] *Ibid*, 88-90.
[47] *Ibid*, 89.

Adams was anxious to avoid the appearance of vaccination because of its unpopularity in London at this time, while at the same time creating a safer form of inoculation with less severe results. The essence of the technique was the use of virus from a previous site of inoculation, propagated through arm-to-arm inoculation. Jenner's biographer, John Baron, believed smallpox could be attenuated in this way, quoting Jenner in support of this view:

> After a series of inoculations with true variolous matter it has been often observed that the severity of the symptoms and the number of pustules gradually diminish till only one is to be seen, at the point of insertion … This fact did not escape the observation of Dr Jenner; in reference to which he has remarked in one of his memoranda, 'Here we see the cowpox and the smallpox acting similar parts: and that in either case the virus may steal, as it were, imperceptibly through the constitution, and give no signal of its presence.'[48]

This description of the attenuation of smallpox provides a background to a discussion of the origins of Jenner's own stocks of vaccine from 1796 onwards.[49] He himself had been inoculated as a boy in 1756 and went onto successfully to practice Suttonian inoculation for many years before his discovery of vaccination.[50] His initial claims for the value of vaccination were very modest:

> Should it be asked whether this investigation is a matter of mere curiosity, or whether it tends to any beneficial purpose? I should answer, that notwithstanding the happy effects of inoculation, with all the improvements which the practice has received since its first introduction into this country, it not very unfrequently produces deformity of the skin, and sometimes, under the best management, proves fatal.[51]

He was therefore anxious to discover a safer and less severe form of inoculation, and experimented on the 14th May 1796, when he injected James Phipps with cowpox taken from the hand of the milkmaid Sarah Nelmes.[52] After this first trial vaccination, Jenner did not achieve further success until the spring of 1798, when more than thirteen people were vaccinated again with cowpox discovered in the Berkeley area.[53] The clinical reactions at the site of injection were rather severe with 'an extensive erysipelatous inflammation … with some degree of pain', resulting in the application of 'a little mild caustic' to the sites of injection on two of the children vaccinated – the

---

[48] *Ibid*, 91.
[49] Davenport et.al. mistakenly state that Jenner's first name was William, but it was in fact Edward. Davenport et.al., 'Urban inoculation',189.
[50] Razzell, *The Conquest,* 23, 93, 94
[51] *Ibid*, 93.
[52] It is possible that the cowpox in question was the result of a milkmaid accidentally inoculating the cow with smallpox, resulting from itching an arm which had previously been inoculated with smallpox. There had been a general inoculation in Berkeley in Gloucestershire in 1795. See Razzell, *The Conquest*, 114
[53] Razzell, *Edward Jenner's Cowpox Vaccine.*

prelude to a series of severe reactions which Jenner recommended should be treated with caustic.[54]

After these initial successes, Jenner lost his stock of vaccine and was unable to supply supporters with virus to carry out vaccinations. Towards the end of January 1799, an outbreak of cowpox was discovered at a London milk farm in Gray's Inn Lane, and William Woodville, physician to the London Smallpox Hospital, collected some cowpox and vaccinated fourteen people with the virus. However, anxious about the effectiveness of vaccination in protecting against smallpox in the London Smallpox Hospital, Woodville then variolated a number of them:

> Among the patients inoculated for the Cow Pox during the first week in which I obtained the matter of this disease, several were so circumstanced as to be afterwards constantly exposed to the Infection of Small Pox. Having no proof that the progress of the infection of the former would supersede that of the latter, I used the precaution to inoculate patients with variolous matter on the fifth day after that taken from the cow.[55]

Six of the ten cases had pustular eruptions strongly resembling smallpox, and of the next five hundred 'vaccinations' carried out by Woodville, nearly two-thirds had pustular eruptions other than at the site of injection, very similar to the results of the old inoculation.[56] These pustular eruptions diminished through subsequent arm-to-arm inoculation, particularly when taken from the site of a previous injection, until eventually these 'vaccinations' resulted in just a local vesicle at the site of injection, resembling classical vaccination.[57] This stock of 'vaccine' was sent out widely by Woodville and colleagues and eventually acquired the reputation of being the 'world's lymph'.[58]

Jenner had lost his own cowpox vaccine and was supplied on the 15th February 1799 with virus taken Woodville's stock of 'vaccine'. According to Woodville, 'the matter sent was taken from the arm of Ann Bumpus, who had three hundred and ten pustules, all of which suppurated.'[59] Jenner had received this virus on a dried thread from Pearson, and described the resulting inoculations as follows:

> Dr Pearson … was dispersing threads embued in the virus to various places in our own country, and to many parts of the Continent … in many places where the threads were sent a disease like mild smallpox frequently appeared; yet, curious to relate, the matter, after it had been used six or seven months, gave up the variolous character entirely and assumed the vaccine; the pustules declined more and more, and at length became extinct. I made a few experiments myself with this matter, and

[54] *Ibid*, 9-11.
[55] *Ibid*, 16.
[56] *Ibid,* 16,17.
[57] *Ibid,* 42-44.
[58] *Ibid*, 8, 32.
[59] *Ibid*, 22.

> I saw a few pustules on my first patients; but in my subsequent inoculations there were none.[60]

This process of attenuation of smallpox virus through arm-to-arm transmission – using sites of previous injections – is similar to that achieved by Longworthy and Arscott in their earlier trials with inoculation. However, in the earlier stages of attenuation, there were occasional severe reactions which in some cases led to minor smallpox epidemics.

On December 11th 1799, Dr. Andre of Petworth in Sussex, wrote the following account of the 'vaccine' which had been sent to him by Pearson for his practice of vaccination:

> The matter sent from Brighton to Petworth produced a disease in every shape resembling smallpox: the time of sickening, the symptoms, the eruptions and their maturation were the same. The number inoculated was fourteen. Three of these were children at the breast; the number of eruptions was from three to twelve. The ages of the remaining eleven were from three to fourteen, and the number of eruptions from fifty to a thousand.[61]

An elderly woman visiting the house in which the children were isolated caught smallpox, infected her husband, and died soon afterwards of the disease.[62] This was not the only case of an epidemic being caused by the use of the new 'vaccine'. At the beginning of July 1800, Dr Waterhouse of Marblehead near Boston in the United States, received vaccine from Haygarth of Bath, which had been 'procured from Dr Jenner's stock by Mr. Creaser.'[63] Waterhouse gave the following description of two of the first cases he 'vaccinated' with this virus:

> They both went through the disease with … symptoms … very similar to those of the lighter kind from the inoculation for the smallpox … The striking similarity of symptoms has induced some practitioners in this country … to conclude, that the kine-pox [cowpox] was only a variety of the smallpox.[64]

The result of these inoculations was an outbreak of epidemic smallpox in Marblehead.[65] Waterhouse attempted to justify his practice of vaccination by writing that 'the like occurrences took place in Geneva, and at several places in England, especially at Petworth, where the virus gave a spurious disease … the effects formed a counterpart to the disasters at Marblehead.'[66] He further noted that 'if we are to judge the force of the disease by the number of pustules, it certainly becomes milder as it recedes from the cow', confirming the progressive attenuation of inoculation by arm to arm transfer.

---

[60] *Ibid*, 7, 8.
[61] *Ibid*, 7.
[62] *Ibid.*
[63] *Ibid,* 65.
[64] *Ibid,* 65.
[65] Razzell, *The Conquest,* 47; Razzell, *Edward Jenner's Cowpox Vaccine*, 68, 69.
[66] Razzell, *Edwards Jenner's Cowpox Vaccine*, 73.

There is some evidence that Jenner found other stocks of cowpox for the creation of vaccines,[67] but it is unclear whether these were used widely in England. It appears that Woodville's 'vaccine' continued to be used in London and elsewhere until the middle of the nineteenth century, and it was replaced because it became less effective due to its progressive attenuation.[68]

The Nature of Vaccines

The nature of the vaccinia virus has been clarified by laboratory tests, including DNA analysis. Derek Baxby, the leading authority on the microbiology of poxviruses, has concluded that vaccinia 'could not have been derived from cowpox or smallpox viruses during the last 200 years.'[69] He has further concluded that 'in the case of cowpox, bovine infection is very rare and the domestic cat is the most commonly detected victim. The likely reservoir hosts are rodents, and include … bank voles and woodmice in Britain.'[70]

It is for this reason that Jenner and others probably found it very difficult to locate cowpox. In the nineteenth century in order to create stocks of vaccine a number surgeons resorted to the inoculation of cows with smallpox.[71] It has been argued that some of these stocks of "variola-vaccine" resulted from cross-contamination from residual strains of vaccines still present in the vaccine institutes.[72] However, the inoculation of cows with smallpox was widely practised in India, often in places and depots new to the production of vaccines.

Bhattachrya has described how vaccines were produced in India as follows:

> The most common form of vaccine is use during the nineteenth century was humanised lymph, initially produced by the vaccinators themselves and later in designated depots. This vaccine was generally collected and used locally. The production process involved the collection of pustular material from a cow or buffalo that had been inoculated with smallpox matter. Human beings were operated on with this artificially induced cowpox and then used as sources of vaccine.[73]

---

[67] *Ibid*, 33, 38
[68] *Ibid*, 40, 84.
[69] D. Baxby, 'Poxviruses' in L. Collier et.al. (eds.), *Topley and Wilson's Microbiology and Microbial Infections, Volume 1 Virology, Chapter 21 (1998),* 369; D. Baxby, *Jenner's Smallpox Vaccine: the Riddle of Vaccinia Virus and Its Origins* (London: Heinemann,1981).
[70] Baxby, 'Poxviruses', 377.
[71] Razzell, *Edward Jenner's Cowpox Vaccine*, 98, 99.
[72] A. Herlich et.al., 'Experimental Studies in Transforming Variola Virus into Vaccinia Virus, *Archiv fur die Gesamte Virusforschung*' 12 (1963).
[73] S. Bhattacharya et.al., *Fractured States: Smallpox, Public Health and Vaccination Policy in British India, 1800-1947,* (Hyderabad, India: Orient Longman, 2005), 37.

Some of these vaccines were produced in new depots where no vaccination had been practised previously:

> An animal-vaccine depot was started at Shillong on 13 January 1890, and the lymph from calves inoculated here was subsequently distributed to all civil stations in Bengal. Indeed, the trials were considered so successful that this lymph was preferred to that received from depots in England and Darjeeling.[74]

Bhattachrya has summarized the practice of vaccination in India as follows: 'Cowpox was rare in India – vaccine was often produced by using smallpox scabs to infect animals (not just cows) and the resultant pox pustules were then widely used as a source of vaccine.'[75]

However, modern laboratory research has established that it is impossible to transform smallpox into cowpox,[76] and as Crookshank observed in 1889, 'those who have been have been inoculated with … "variola-vaccine" lymph have not, in the true sense of the word, been vaccinated, they have not been Cow Poxed, but they have been variolated.'[77]

The origin of the Lister Institute stock of vaccine in England is unknown, but there is some evidence that it was sent from Cologne sometime after 1871, and is reported to have been taken from the arm of a Prussian soldier suffering from smallpox.[78]

Conclusion.

Davenport , Boulton and Schwarz have raised some fundamental issues about the history of smallpox in the late eighteenth and early nineteenth century. The present commentary has ranged widely in order to examine some of the implications of their arguments, but the balance the evidence does not point to the increasing infectiousness of the disease. The data reviewed suggests that inoculation in all its forms reduced disease mortality both before and after the end of the eighteenth century. Vaccination – whether derived from smallpox or not – had a significant influence on the popularity of the practice, particularly in areas where the smallpox was endemic, affecting mainly young children.

Parents had feared the disease, and although not entirely fatalistic, had often been unwilling to expose their children to a known risk associated with the old inoculation, but were willing to embrace the new more attenuated 'vaccination' because of its very safe outcome. However, the latter did not give the life-long protection associated with

[74] *Ibid,* 40.
[75] Personal communication from Sanjoy Bhattacharya. See also Bhattacharya, *Expunging Variola: the Control and Eradication of Smallpox in India* (Hyderabad, India: Orient Longman, 2006).
[76] Herlich et.al., 'Experimental Studies'.
[77] E.M. Crookshank, *History and Pathology of Vaccination,* 1 (London: H.K. Lewis, 1889), 301.
[78] Baxby, *Jenner's Smallpox Vaccine,* 181.

variolation, and there were instances of subsequent attacks after vaccination which sometimes resulted in death.

Inoculation had been practised particularly widely in the south of England, where both adults and children were vulnerable to smallpox. When the disease arrived in a parish it created a panic response, which created the conditions for general inoculations. However, as the population became familiar with the benefits of Suttonian inoculation, urban areas like London and Whitehaven did resort widely to the practice, which began to diminish mortality.

Without inoculation and the more attenuated vaccination, England and many other countries would have been decimated by smallpox, with perhaps up to forty-five per cent of the population dying from the disease by the late nineteenth century, equivalent to a new bubonic plague. Whatever the exact relationship between variolation and vaccination, this stands out as a major achievement of preventative medicine.

Preface to the New Edition of *William Shakespeare: the Anatomy of an Enigma*, 2014.

Since the original edition of this book, not a great deal of new biographical information on Shakespeare has become available, except for research by Jayne Archer and colleagues published in 2014. In their book on food and the literary imagination, they discussed Shakespeare's hoarding of grain and his other business activities, summarized as follows:

> During a period of dearth… for those with ready cash, it was a time of opportunity. William Shakespeare, a gifted recycler of plots, saw his chance. … over a 15-year period, Shakespeare purchased food-producing land and stored grain, malt and barley for resale (most likely at inflated prices) to neighbours and local tradesmen. In February 1598 he was prosecuted for holding 80 bushels of malt or corn during a period of shortage – an act similar to the charge levelled against the patricians in *Coriolanus*, who keep 'their storehouses crammed with grain' while allowing the citizens to 'famish'. He pursued those who could not (or would not) pay him in full for these staples and used the profits to further his own money-lending activities … Combining legal and illegal activities – and grain hoarding during a period of shortage was regarded with particular opprobrium – Shakespeare was able to retire in 1613, at the age of 49, as one of the largest property owners in his own town.[1]

A lecture by Jayne Archer at the *Telegraph Hay Festival* on the 23 May 2013, presented the above findings, which attracted world-wide media attention, much of it of a sensational nature.[2] According to the *Sunday Times,* Dr Archer stated that "there was another side to Shakespeare besides the brilliant playwright – as a ruthless businessman who did all he could to avoid taxes, maximize profits at others' expense and exploit the vulnerable – while writing plays about their plight to entertain them."[3]

While it is true that Shakespeare did hoard grain in 1598 – as discussed later in this book – he did so in the company of virtually all of the wealthy men living in and around Stratford at the time. This included all four local magistrates who were meant to enforce the legislation against the forestalling and hoarding of grain.[4] This activity was commonplace among the wealthy, including Shakespeare's father, who had a long history of money lending and illegal speculation in a range of commodities, including grain and other foodstuffs.

In 1588, John Shakespeare claimed in a legal dispute that by losing twenty pounds, he had "totally lost and failed to acquire the whole gain, advantage and profit which he by buying and bargaining with the aforesaid twenty pounds have had acquired to the loss of thirty pounds."[5] He had included his son William in this legal submission, and Shakespeare was probably involved with his father in his trading activities.[6] The historian, Alan Everitt has

---

[1] Jayne Elisabeth Archer, Richard Marggraf Turley and Howard Thomas, *Food and the Literary Imagination* (Palgrave Macmillan, 2014), pp. 82, 83.

[2] There were for example the following publications: 'Shakespeare was tax-evading food hoarder', *The Telegraph,*13 March 2013; 'Study sheds light on Bard as a food hoarder', BBC News, 1 April 2013; 'Shakespeare was a ruthless profiteer and tax dodger' *Los Angeles Times*, 1 April 2013; 'Bad Bard? Shakespeare profited from famine by hoarding grains.' *USA Today*, 2 April 2013; 'New study finds that Shakespeare was tax-evading, grain-hoarding asshole', AV Club Newswire, 1 April 2013; 'Knowing Shakespeare fiddled his taxes tells us nothing', *Independent*, 3 April 2013.

[3] *Sunday Times*, 31 March 2013.

[4] See pages 140-142.

[5] See page 21.

[6] See page 23.

described the lifestyle of 'individual traders' in the late sixteenth century, who were willing to 'buy and bargain' any commodity that would make a profit:

> [They often] operated through a network of neighbours, friends and relatives. Sons, fathers, cousins … all were drawn into the circle … In consequence of this network of kinship and acquaintance …they had developed into a distinct and self-conscious community of their own: a kind of society of wayfarers … Much of the dealing in which travelling merchants engaged took place in … the provincial inn … Agreement between prospective dealers was rarely reached without a lengthy series of 'speeches' and 'communications', and the company often sat far into the night before the transaction was concluded.[7]

In the Elizabethan period, before the development of professional theatres, inns were frequently used for staging plays.[8] Shakespeare and his father were probably intimately familiar with Elizabethan drama through John Shakespeare's wayfaring life style, particularly when centred on provincial and metropolitan inns.

Everitt concluded that the wayfaring community

> Developed an ethos of its own dissimilar to that of the settled society of town and village. Its spirit of speculation and adventure ran counter to the stable traditions of the English peasantry … it is not fanciful to trace a connection between the spread of private trading in the early seventeenth century and the rapid rise of Independency. For Independency was not a rural and static religion … but mobile, virile, and impatient of human institutions, like the wayfaring community itself.[9]

Shakespeare scholars have always been puzzled by Shakespeare's acquisition of the language and sophistication necessary to write cosmopolitan plays of such quality. On the above evidence, he acquired such abilities through his participation in the culture of the wayfaring trading community associated with his father John Shakespeare.

Shakespeare's business activities should not therefore be seen only as a negative example of ruthless trading, but also providing a link to a highly cosmopolitan way of life. Many of his middle and upper class contemporaries were engaged in the same trading activity, and the late sixteenth century was a time of intense capitalist development.[10] This involved growing economic and social inequality, summarized by the historian Lawrence Stone as follows:

> As a result of population growth … the excess supply of labour relative to demand not only increased unemployment, but forced down real wages to an alarming degree … [there was] a polarization of society into rich and poor: the upper classes became relatively more numerous and their real incomes rose; the poor became more numerous and their real incomes fell.[11]

In his personal life, Shakespeare had traversed a complete range of economic circumstances, from early comfortable family prosperity to dire poverty, and then wealth at the end of his life. It was this range of experience which gave him the understanding and breadth of knowledge

---

[7] See pages 22-24.
[8] F.E. Halliday, *A Shakespeare Companion 1564-1964* (1964), p. 243.
[9] See page 24.
[10] See L Neal and J.G. Williamson, *Capitalism: Volume 1: The Rise of Capitalism from Ancient Origins to 1848* (2014).
[11] Peter Razzell, *Mortality, Marriage and Population Growth, 1550-1850* (2016), p. 107.

which enabled him to write plays with such a universal appeal, although with some ambivalence when it came to attitudes towards the poor:

> But 'tis common proofe,/That Lowlynesse is young Ambitions Ladder,/Whereto the Climber upward turns his Face:/But when he once attaines the upmost Round/ He then unto the Ladder turns his Backe,/ Lookes in the Clouds, scorning the base degrees/ By which he did ascend.[12]

However, this ambivalence did not prevent him from expressing sympathy for the plight of the poor. The speech by two citizens in *Coriolanus* reveals considerable understanding of the anger of those suffering from famine when grain was being hoarded by the wealthy:

> … they nere car'd for us yet. Suffer us to famish, and their Store-houses cramm'd with Graine … If they would yeelde but the superfluitie while it were wholesome, wee might guess they releeved us humanely … our suffering is a gaine to them. Let us revenge this with our Pikes, ere we become Rakes.[13]

During the 1598 crisis, the poor of Stratford threatened violence against the rich, which no doubt Shakespeare was aware of.[14] The poor had appealed to the local magistrates for enforcement of the protective legislation, without realizing that all four magistrates were grain-hoarders, with strong links to the local townsmen. Shakespeare had become part of the local elite and no doubt felt threatened by the poor, who constituted nearly a half of the total population of Stratford.[15]

There has been a great deal of idealization of Shakespeare because of the outstanding quality of his writing. However, his sonnets indicate that he was tormented by feelings of inadequacy and a sense of alienation, but both the plays and sonnets demonstrate he was also a man of great sympathy and understanding. His business activities show that he was capable of ruthlessness, but this must be understood in the context of his times. He had restored the fortunes of his bankrupt family, at the same time creating the world's greatest literature. There is also evidence that he came to terms at the end of his life with the personal and social tensions reflected in his writings:

> Sweet are the uses of adversity, which like a toad, ugly and venomous, wears yet a precious jewel in his head. And this our life, exempt from public haunt, finds tongues in trees, books in the running brooks, sermons in stones, and good in everything.

[12] See page 143.
[13] See page 144.
[14] See pages 141, 142.
[15] See page 142.

Mortality, Marriage and Population Growth in England, 1550-1850

This book is dedicated to Tinka Rojas, whose sense of humour and warm support has been invaluable in writing this book.

Mortality, Marriage and Population Growth in England, 1550-1850

Peter Razzell

Caliban Books

Published 2016
Caliban Books,
30 Ingram Road, London, N2 9QA
Copyright Peter Razzell
ISBN 978-0-904573-190

All right reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior permission of the copyright owner.

Acknowledgements

This book is based on research which has taken place over a period of fifty years, and many people have commented on different aspects of the research. I would like to thank the following for their comments: Alan Armstrong, Massimo Livi Bacci, Jeremy Boulton, Jack Caldwell, Michael Drake, Tim Dyson, Richard Easterlin, Eilidh Garrett, Sumit Guha, Bernard Harris, John Hatcher, Steve King, John Landers, Peter Lindert, Graham Mooney, Cormac O'Grada, Jim Oeppen, Samuel Preston, Ruth Richardson, Steven Ruggles, Keith Snell, Christine Spence, Matthew Woollard and Tony Wrigley. The generous help of Sue Gibbon, Tim Lawrence and members of staff of the Society of Genealogists' library, and John Page of the Bedfordshire Family History Society, is greatly appreciated.

Chapters

		Page
Preface		11
Chapter 1	The Reliability of Parish Registration and Population Growth in England	15
Chapter 2	The History of Infant and Child Mortality in England, 1600-1850	29
Chapter 3	The History of Adult Mortality in England, 1600-1850	43
Chapter 4	The History of Marriage and Fertility in England, 1550-1850	57
Chapter 5	Explaining Changes in Mortality	92
Chapter 6	Population Growth and the Development of Capitalism	99
Chapter 7	Conclusion	119

Tables

	Page
1. The Family of Samuel and Sarah Fowler, Tyler and Bricklayer, of St. Antholin's, London	17
2. Estimates of Burial Under-Registration in Fifteen Cambridge Group Reconstitution and Twenty-Eight Aggregative Bedfordshire Parishes	18
3. Proportion of Probate Cases Traced in One Hundred and Twenty Four Bedfordshire Burial Registers, 1543-1849	19
4. Proportion of Probate Cases Traced in Different English Parishes, 1546-1793	20
5. Analysis of Burial Registration of Same-Name Siblings in Colyton, 1538-1851	21
6. Comparison of 1851 Census Birthplace Statements with Baptism Register Returns in Forty-five Parishes, 1761-1834	22
7. Husbands and Wives Enumerated in the 1782 Cardington Census and Traced in Bedfordshire Baptism Registers	23
8. Wrigley and Schofield's Estimated Total Number of Baptisms and Burials in England, 1539-1809	27
9. English Baptism and Burial Rates in England Calculated from Cambridge Group Data	28
10. Infant and Child (1-4) Mortality in Eighteen English Parishes, 1600-1837	31
11. Infant and Child (1-4) Mortality in Eighteen English Parishes, 1600-1837	32

12. Infant and Child (1-4) Mortality in Sixteen London Parishes, 1539-1849 35
13. Infant and Child (1-4) Mortality amongst Elite and Control Families in Seventeen Cambridge Group Parishes, 1600-1799 37
14. Infant and Child (1-4) Mortality Rates amongst London Wealth and Non-Wealth Holders, 1681-1709 38
15. Infant and Child (1-4) Mortality Rates by Occupational Group in Liverpool, 1675-1749 39
16. Infant and Child (1-4) Mortality Rates by Socio-Economic Status in Truro, Cornwall, 1629-1749 39
17. Infant, Child and Adult Mortality in London by Rateable Value of Registration District, 1839-44 40
18. Average Annual Child and Adult Mortality per 100 Living in Wealthy and Poor Registration Districts, 1851-60 41
19. Paternal Mortality in English Regions, 1710-13 45
20. Fathers of Spinsters Under Twenty-One: Proportion Dead in English Regions, 1600-1799 48
21. Mean Levels of Premium Paid by Father's Occupation, Inland Revenue Register 1710-25 50
22. Mortality amongst Fathers Listed in the Inland Revenue Register 1710-13 by Amount of Premium Paid 51
23. Mortality amongst London Fathers Listed in the Inland Revenue Register, 1710-13 52
24. Paternal Mortality amongst Fathers of Spinsters Marrying Under Twenty One, by Occupation of Husband in East Kent, 1619-1809 53
25. Mean Number of Years Lived by Members of Parliament, 1660-1820 54
26. Aristocratic Expectation of Life at the Age of Twenty-Five, 1650-1849 55
27. Proportion of Widow and Widower Marriages in East Kent, 1619-1809 56

28. The Ratio of Baptisms to Marriages in England and Wales, 1700-1836 57
29. Proportion of Single Women in Lichfield Staffordshire, Stoke-on-Trent Staffordshire and Chilvers Coton Warwickshire 1684-1701 and 1851 60
30. Proportion of Single Women in Ardleigh, Astley, Cardington, Corfe Castle, Wembworthy and Wetherby, 1776-96 and 1851 61
31. Proportion of Spinsters Listed in Twenty-Three Bedfordshire Burial Registers, 1695-1704 and 1795-1804 62
32. Proportion of Single Women in Sussex, 1593-1694 and in the Sussex 1851 Census 63
33. Proportion of Single Women in Norfolk, 1649-1714 and in the Norfolk 1851 Census 64
34. Proportion of Single Women in the Dioceses of Canterbury, Chester, Chichester, Ely, London, Salisbury, York, the Archdeaconries of Lewes and Richmond, and the Cambridge University Courts, 1550-1699 65
35. Proportion of Single Women Aged Over Thirty-Five in Different Counties, 1550-1699 and 1851 66
36. Proportion of Female Deponents Single in the London Consistory Court, 1583-1817 67
37. Proportion of Single Women in St. Botolph Aldgate Burial Register, London, 1579-1600 68
38. Proportion Women Single in St. Dunstan Stepney Burial Register, 1732-36 69
39. Proportion of Single Female Deponents in the Yorkshire Church Court, 1560-1857 70
40. The Occupations and Literacy Levels of Male Deponents in Sussex in 1556-1694 71
41. Proportion of Women Unable to Sign Legal Depositions in Northern England, 1640-1770 72

42. Literacy and Single Status amongst Women Aged 35+ in London, 1786-1816 74
43. Socio-Economic Status and Women Marking Marriage Registers in London Registration Sub-Districts in the Mid-Nineteenth Century 75
44. Female Marriage Patterns in Sub-Registration Districts of London in 1861 76
45. Female Marriage Patterns in London Areas in 1851 77
46. Relation between Fertility and the Socio-Economic Status Rankings of London Registration Districts, 1849-51 79-80
47. Socio-Economic Characteristics of Eight English Parishes, 1851 English Census 81
48. Proportion of Single Women by Age Group in Eight Parishes, 1851 82
49. Number of Births per 100 Women Aged 15-44 in Eight Registration Districts, 1860-62 83
50. Bedfordshire Baptism Fertility Rates, 1849-51 84
51. Women from Landed Families in Hertfordshire and Northamptonshire: Proportion Who Were Single at the Age of 35, 1550-1849 85
52. Proportion of Women Signing London Wills, 1590-1851 86
53. The Mean Weekly Wages of Adults and Children in English and Scottish Factories 106

Preface.

In 1958, H.J. Habakkuk put forward a general thesis on the relationship between demographic and economic history in England before the nineteenth century. He presented a 'heroically simplified version of English history', which ran as follows:

> '... long-term movements in prices, in income distribution, in investment, in real wages, and in migration are dominated by changes in the growth of population. Rising population: rising prices, rising agricultural profits, low real incomes for the mass of the population, unfavourable terms of trade for industry – with variations depending on changes in social institutions, this might stand for a description of the thirteenth century, the sixteenth century and the early seventeenth, and the period 1750-1815. Falling or stationary population with depressed agricultural profits but higher mass incomes might be said to be characteristic of the intervening periods.'[1]

This argument is based on the assumption that population change was largely exogenous to economic development, an assumption supported by Chambers and others writing in the period leading up to the 1960s and early 1970s.[2] The main focus of Chambers' work was on the 'autonomous death rate'[3], and he was particularly critical of the influence of Malthus with his emphasis on fertility shaped by the standard of living.[4]

Chambers' argument was challenged by Wrigley and Schofield in research carried out with the Cambridge Group, which covered nearly four million individual parish register entries, as

---

[1] Habakkuk (1965), 148.
[2] Brownlee (1915-16); Griffiths (1926); Buer (1968); Chambers (1972); Utterstrom (1965); Jutikkala and Kauppinen (1971).
[3] Chambers (1972), vi, 82, 87.
[4] Ibid, 2-5, 17, 108, 119-120, 147, 149.

well as the linkage of detailed material from 26 reconstitution studies. Their main findings were that after a period of stagnation in the second half of the seventeenth and first half of the eighteenth century, population began to grow rapidly after the middle of the eighteenth century, with about two-thirds of the population increase due to a rise in fertility, and one third to decreasing mortality.[5] They have argued that the growth of population was mainly the result of the increase in fertility associated with a fall in the age of marriage, which in turn was due to growing real incomes lagged over time, a conclusion largely confirming the work of Malthus.

Evidence is produced in this book to present an alternative view: that fertility actually fell in the eighteenth century and that mortality reduction was the main engine of population growth in England during this period. No attempt has been made to create a mathematical model of population growth, which involves many demographic unknowns requiring a range of arbitrary assumptions.[6] Manipulation of these assumptions allows the shaping of conclusions to validate a particular thesis, in effect creating a circular self-affirming set of theoretical arguments. I have adopted a different methodological approach: an emphasis on sources which allow the direct empirical measurement of individual variables, along with the triangulation of data to evaluate the reliability of findings.

Because the main arguments and conclusions of this book are controversial, I have discussed in great detail both the methodological issues and the detailed findings which support those arguments. The result of this detailed work is the conclusion

---

[5] Wrigley, Davies, Oeppen and Schofield (1997), 126.

[6] For example, as a part of their back projection programme, Wrigley and Schofield reduced the size of the age group 90-94 enumerated in the 1871 Census by 44%; if they had chosen instead to reduce this by 40%, their estimate of the English population in 1541 would have been about 9% larger. See Lee and Lam (1983), 446.

that population growth was largely exogenous to economic change in England from at least the early seventeenth century onwards. Demography has been seen traditionally as a function of economics, but the English evidence now suggests that since the early modern period it was largely independent of economic development. The further conclusion is that population growth contributed to the development of capitalism through the creation of labour surpluses and increases in aggregate demand, similar to what is now occurring globally, with multi-national companies exploiting demographically generated labour surpluses, resulting in the growth of global capitalism.

Chapter 1: The Reliability of Parish Registration and Population Growth in England.

Central to all discussion of population history before the introduction of civil registration in 1837 is the reliability of parish registers. Because of deficiencies in parish registration, it is necessary to inflate the number of burials, baptisms, and marriages in order to establish reliable measures of deaths, births, and marriages. During the period in which the Cambridge Group's research was carried out there were no methods available to independently measure the reliability of inflation ratios. This was recognized by Wrigley *et.al.* when they concluded that 'the lack of a reliable alternative data source makes it impossible … to test effectively the completeness of Anglican registration', resulting in 'arbitrary' inflation ratios which can only be based on 'internal plausibility and internal consistency of the results obtained.'[7]

A number of new methods to measure burial register reliability are now however available:

1. Comparing individual entries in probate and burial register returns.
2. Tracing married couples from one census to a subsequent one, checking whether the partner of a newly enumerated widow or widower has been registered in the burial register.
3. Comparing lists of pauper burials with parish register entries.
4. Using reconstitution schedules and tracing children under nine years of age in a subsequent census listing parents and fellow siblings.
5. Tracing 'traffic in corpses' listed in one parish register but occurring in another parish.
6. Analysing bills of mortality and data in burial registers.
7. Comparing civil register returns of deaths with parish entries of burials.

[7] Wrigley and Schofield (1981), 137; Wrigley, Davies, Oeppen and Schofield (1997), 91-92.

8. Employing the same name technique which searches for children known to be dead in the burial register.[8]

Numbers two to seven of the above methods are only available for specific periods, but one and eight are applicable to the whole parish register period between 1538 and 1837. However, it is necessary to use all eight methods wherever possible, in order to triangulate the reliability of the findings of any one method.[9]

The most important of the above eight ways of measuring burial registration reliability is the same-name technique. There was a custom in England to give the name of a dead child to a subsequent child of the same sex. Evidence from local censuses and other listings suggests that there were no living children with the same name in individual families in the period 1676-1849, According to probate evidence for different parts of England during the period 1600-1649 there were 13 living same-name children out of a total of 2,144 – less than 1% – and some of these children may have been step-siblings.[10]

Where two children of the same family were baptised with an identical name, it is therefore possible to measure the completeness of burial registration by searching for the first same-name child in the burial register. The technique can only be applied to families with at least two recorded baptisms of children of the same sex, but it is a valuable method of assessing the quality of burial registration. This can be illustrated by the example of one London family listed by the genealogist Percival Boyd, and traced in the 1695 London Marriage Duty Listing.

---

[8] For the application of these eight methods see Razzell 2007, 3-39; Razzell, Spence and Woollard, (2010), Razzell (2011a), Razzell (2011b). Razzell (2012).

[9] For the triangulation of a number of these methods applied to London data see Razzell (2011a).

[10] See Razzell (2011b), 67 for a list of the places and dates involved.

Table 1: The Family of Samuel and Sarah Fowler, Tyler and Bricklayer, of St. Antholin's, London. [11]

Name Of Child	*Date Of Baptism*	*Date Of Burial*
Thomas	05/07/1677	04/01/1721
Samuel	**04/05/1679**	**29/04/1681**
William	08/01/1683	03/06/1708
Samuel	10/05/1685	15/02/1688
John	**07/08/1687**	**-**
John	**12/05/1689**	**09/10/1692**
Sarah	22/04/1691	06/02/1748
Mary	18/07/1693	12/11/1694
John	21/11/1695	-
1695 Marriage Duty Listing: Samuel Fowler, Wife Sarah, Son James, Son Thomas, Son William, Daughter Sarah.		

Of the three same-name cases, high-lighted in bold, two of them were traced in the burial register. The second same-name case – John baptised on the 7th August 1687 – was found neither in the burial register nor in the 1695 Marriage Duty Listing, indicating that he probably died without being registered. (The last John was baptised in late 1695 and therefore did not appear in the Marriage Duty Listing made before that date).

The same-name method allows for the correction of burial under-registration by multiplying recorded burials by the number of same-name cases divided by the number of same-name cases found in the burial register. In the case of the Fowler family the correction ratio is 3/2. This inflation ratio corrects both for non-registration due to omission from the burial register, as well as burial in neighbouring parishes and elsewhere, accounting for all

[11] For the background to this table see Razzell and Spence (2007), 274.

forms of under-registration. The findings from same-name research can be evaluated through data on probate and burial registers.

Table 2: Estimates of Burial Under-Registration in Fifteen Cambridge Group Reconstitution and Twenty-Eight Aggregative Bedfordshire Parishes.

Period	*Proportion of Untraced Burials in Same Name Cases in Fifteen Cambridge Group Reconstitution Parishes.*[12]	*Proportion of Untraced Burials through the Comparison of Probate and Burial Registers in Twenty-Eight Cambridge Group Aggregative Bedfordshire Parishes.*[13]
1600-49	31%	21%
1650-99	25%	27%
1700-49	25%	23%
1750-99	23%	21%
1800-49	20%	23%

The above two groups are not strictly comparable – one is for children in reconstitution research, the other is adults in probate documents. The probate/burial register research excludes defective periods in which there were gaps in the registration system, occurring particularly during the civil war period 1640-60.[14] The

[12] The parishes in the sample are: Alcester, Aldenham, Ansty, Austrey, Banbury, Bottesford, Bridford, Colyton, Dawlish, Eccleshall, Great Oakley, Hartland, March, Odiham, Shepshed. For some of the same-name data see Razzell (2007), 15. This was supplemented by the analysis of material kindly supplied by Gill Newton.

[13] Razzell, Spence and Woollard (2010), 53.

[14] Wrigley and Schofield estimated that the proportions of defective burials in the aggregative sample were as follows: 1558-1640: 6.3%; 1640-53: 26.6%; 1653-60: 17.5%; 1660-95: 7.0%; 1695-1754: 1.9%; 1754-1812: 0.8%; 1813-39: 0.1%. Wrigley and Schofield (1981), 25.

same-name data also largely exclude defective periods, as registers were not selected for reconstitution research where there were significant gaps and other obvious difficulties.[15]

In the period 1600-49 the proportion of untraced burials is higher in the reconstitution than in the probate/burial register sample, which may be partly be due to the existence of some living same-name children in this period. After the middle of the seventeenth century the pattern of untraced burials is approximately similar in both groups. The proportion of probate cases untraced in 124 burial registers for the whole of Bedfordshire are similar to the Bedfordshire Cambridge Group parishes in Table 2:

Table 3: Proportion of Probate Cases Traced in One Hundred and Twenty Four Bedfordshire Burial Registers, 1543-1849.[16]

Period of Probate	*Total Number of Probate Cases*	*Proportion of Burials Untraced*
1543-99	610	26%
1600-49	3731	21%
1650-99	4626	26%
1700-49	6030	23%
1750-99	3744	22%
1800-49	3303	27%
Total	22044	24%

[15] Ibid, 91.

[16] Razzell, Spence and Woollard (2010), 42. Research comparing civil registration returns and burial register data confirms the level of burial under-registration in the 1840s, as does tracing married couples from one census to a subsequent one, checking whether the partner of a newly enumerated widow or widower has been registered in the burial register. See Ibid, 50, 51.

Burials were traced by using the Bedfordshire Family History Society's burial database which covers the whole county, allowing a search of cases buried both inside and outside the parish of residence. The numbers of untraced burials are minimal because of strict matching criteria, but overall there was little variation over time, with about a quarter of all burials missing from the parish registers. This is similar to that found in other parishes outside of Bedfordshire:

Table 4: Proportion of Probate Cases Traced in Different English Parishes, 1546-1793.[17]

Parish and Period	*Total Number of Probate Cases*	*Proportion of Burials Untraced*
Newbury, Berkshire, 1546-1648	50	24%
Colyton, Devonshire, 1553-1773	124	28%
Long Melford, Suffolk, 1559-1610	97	21%
Great Dunmow, Essex, 1559-1610	50	20%
Thaxted & Saffron Walden, Essex, 1560-1602	82	13%
Hartland, Devon, 1598-1793	81	19%
Lyme Regis, Dorset, 1664-1749	232	35%
Total	696	26%

The overall proportion of missing burials – 26% – is approximately the same as that found in the much larger Bedfordshire sample, and

[17] Razzell (2007), 30.

also similar to the research on same-name cases in Table 2 and to a larger sample of 18 reconstitution parishes to be discussed later.[18]

Colyton is the parish in which E.A. Wrigley developed his work on family reconstitution, providing a suitable focus for a study of burial registration. The following table summarizes an analysis of same-name cases in Colyton:

Table 5: Analysis of Burial Registration of Same-Name Siblings in Colyton, 1538-1851.[19]

Period	*Total Number of Cases*	*Proportion of Untraced Cases*
1538-1600	95	35%
1601-50	121	41%
1651-1700	114	25%
1701-50	84	36%
1751-1800	94	36%
1801-51	115	15%
Total	623	31%

There is no linear trend in the proportion of untraced cases, but there was a sharp improvement in burial registration in the period 1801-51. This can be compared to parish register entries with civil register returns for the period 1837-50. According to the Colyton civil register, there were 199 children dying under the age of ten in 1837-50, of which 170 were registered in the Anglican parish register, an omission rate of 15%. This figure is identical to the 15% of same-name children not traced during 1801-51. It is also possible to compare evidence on people leaving wills with entries in the burial register, and of 124 wills registered in Colyton in 1553-1773, 35 – 28% – could not be found in the parish register –

[18] See Table 10.
[19] Razzell (1994), 188.

slightly smaller than the untraced cases in 1538-1800 in Table 5 – 34%.[20]

Research on the reliability of baptism registration raises similar problems to that on burial registration. The comparison of census returns with baptism register entries in parishes from different parts of England indicates that there were no significant changes in the reliability of birth registration in the period between 1761 and 1834.

Table 6: Comparison of 1851 Census Birthplace Statements with Baptism Register Returns in Forty-Five Parishes, 1761-1834.[21]

Period	*Total Number of Cases*	*Proportion of Untraced Baptisms*
1761-80	415	29%
1781-1800	1690	35%
1801-20	3506	33%
1821-34	5343	29%
Total	10954	31%

For the period before 1761 it is possible to assess the accuracy of baptism registration through research on the Cardington census of 1782, which listed the birthplace of all husbands and wives enumerated in the census, and included the maiden names of wives. The editor of the census, David Baker along with colleagues traced all baptisms occurring in the county of Bedfordshire, more than two-thirds of which took place outside of Cardington

[20] Razzell (1994), 189.
[21] Razzell (1994), 95. For a full discussion of the methodology used in compiling and interpreting these figure see Ibid, 82-149.

Table 7: Husbands and Wives Enumerated in the 1782 Cardington Census and Traced in Bedfordshire Baptisms Registers.[22]

Period of Estimated Birth	*Number Listed as Born in Bedfordshire*	*Proportion Untraced in Baptism Registers*
1710-42	119	29%
1743-62	87	21%
Total	206	25%

The overall proportion of untraced baptisms – 25% – is similar to the percentage of untraced Bedfordshire burials in the probate/ burial research in the period, 1700-49 – 23%.[23] Baker and colleagues attempted to trace the marriages of the couples enumerated in the census. 57 of the 204 cases – 28% – could not be traced in marriage registers in Bedfordshire and elsewhere, similar to the levels of burial and baptism under-registration.[24]

The main reason for omissions of birth, deaths and marriages was probably clerical negligence,[25] as indicated by Burn in his study of parish registers, first published in 1829:

> 'The custody of parish registers having been frequently committed to ignorant parish clerks, who had no idea of their utility beyond their being occasionally the means of putting a shilling into their own pockets for furnishing extracts, and at other times being under the superintendence of an incumbent, either forgetful, careless or negligent, the result has necessarily been, that many Registers are miserably defective, some

[22] Razzell, Spence and Woollard (2010), 48.
[23] See Table 3.
[24] Baker (1973). The traced marriages occurred in the period 1731-1782, and 56 of the 147 marriages – 38% – took place outside of Cardington.
[25] See Razzell (1994), 108-111.

having the appearance of being kept from month to month, and year to year, yet being deficient of a great many entries.'[26]

This clerical negligence appears to have been present from the sixteenth century onwards. For example, 'in 1567 the incumbent of Tunstall, Kent, appeared to have tired of registering the Pottman family because of its concentration in the parish and simply stated in the register: "From henceforwd I omit the Pottmans." '[27]

Some of the neglect of burial registration was due to the non-payment of fees. In the Northamptonshire parish of Brington, 'the very true reason why this register, is found as imperfect in some years as from 1669 to 1695 is because the parishioners could never be persuaded to take to see it done, nor the church-wardens as ye canon did require, and because they refuse to pay such dues to ye curate as they ought by custome to have payed.'[28]

In 1702-03 'a Committee of Convocation drew up a list of ecclesiastical offences notoriously requiring remedy, in which irregularity in keeping registers is prominent in the list of gravamina.'[29] Evidence for clerical negligence became abundant in the early nineteenth century. The *Gentleman's Magazine* remarked in 1811 that 'the clergyman (in many country places) has entered the names at his leisure, whenever he had nothing better to do, and perhaps has never entered them at all.'[30] The *Report of the Select Committee on Parochial Registration in 1833* provided substantial evidence on the reasons for defective parish registration. One of the witnesses, Mr William Durrant Cooper, a solicitor, had extensive experience of tracing individuals in parish registers for property cases, and concluded that parish registration was 'exceedingly defective … [with] a very large number of marriages,

[26] Burn (1862), 18.
[27] Ibid, 41.
[28] Cox (1910), 20, 21.
[29] Tate (1969), 49.
[30] Burn (1862), 42.

deaths and baptisms not entered at all … especially deaths.'[31] To illustrate this, he gave the following example:

> 'On the sale of some property [in 1819] from Mr Cott to Lord Gage, it was necessary to procure evidence of the death of three individuals, Mrs Pace, Mr Tuchnott and Mrs Gouldsmith. They were at different places, all in Sussex; Mrs Pace was regularly entered; Mr Tuchnott was buried at Rodmell, about five miles from Lewes, and on searching for the register of burial we found no entry whatever. On making an inquiry in the churchyard of the sexton, he stated he recollected digging the grave, and the ceremony being performed; Mr Gwynne, the rector, whose neglect in that and other parishes is well known, had omitted to enter it … Mrs Gouldsmith, who was buried at Waldron, in the same county, was not entered, but on going to the parish clerk, who was a blacksmith, he stated he recollected the circumstance, and accounted for her burial not being entered in this way: he said it was usual for him, and not the clergyman, to take account of the Burials, and he entered them in a little sixpenny memorandum book … If it so happened that the fee [of one shilling] was paid at the time, as was the case with affluent persons, no entry would appear in his book, he only booked what was due to him, and as the clergyman entered the parish register at the end of the year from his book, and not at the time of the ceremony, all burials that were not entered in his book would not find their way into the register.'[32]

Wrigley and Schofield had assumed in their aggregative research that other than defective periods, burial registration was perfect in the period leading up to the middle of the seventeenth century and only deteriorated significantly at the end of the eighteenth

[31] *Report of the Select Committee on Parochial Registration*, 24.
[32] Ibid*,* 25.

century.[33] This is reflected in the inflation ratios they used to translate burials into deaths which were as follows: 1540-99: 0%; 1600-49: 0%; 1650-99: 2%; 1700-49: 5%; 1750-99: 10%: 1800-39: 26%.[34] The sharp increase in estimated under-registration in 1800-39 is mainly due to 'residual non-registration' – 62% of the inflation ratio. Research discussed above as well as that on a number of parishes in different parts of the country indicates that between a fifth and a third of all burials were missing from parish registers in the period 1550-1837, with no clear linear trends in register reliability over time.[35]

Wrigley and Schofield's inflation ratios for baptisms in the period 1710-1836 are as follows: 1710-42: 11.5%; 1743-62: 13.9%; 1763-80: 16.4%; 1781-1800: 26.0%; 1801-20: 42.9%; 1821-36: 39.1%.[36] They assumed that the quality of birth registration was relatively good in the period 1710-80, but deteriorated sharply from the 1780s onwards, particularly after 1801.[37] This assumed pattern is at variance with the findings outlined above, which essentially show no major changes in the eighteenth and early nineteenth century.

The above data on parish register reliability puts into question the accuracy of the Cambridge Group's population estimates, central to the analysis of the relationship between population and economic growth. Given the relatively unchanging levels of parish register reliability for most of the parish register period, the most appropriate way of estimating population growth

[33] Wrigley and Schofield (1981), 561.
[34] Ibid, 561.
[35] Razzell (2007).
[36] Wrigley and Schofield (1981), 541-44.
[37] Lindert used Registrar-General's nineteenth century data to estimate birth registration patterns, and concluded that 'birth registration was worse before 1780 than after.' Lindert (1983), 136.

is to use the Cambridge Group's raw figures of national baptisms and burials.

Table 8: Wrigley and Schofield's Estimated Total Number of Baptisms and Burials in England, 1539-1809.[38]

Period	*Number of Baptisms*	*Number of Burials*	*Baptisms Minus Burials as a Proportion of Baptisms*
1539-1569	3345389	2726288	23%
1570-1609	4847157	3690064	31%
1610-1649	5926116	5024644	15%
1650-1689	5587210	5841096	-5%
1690-1729	5875710	5770930	2%
1730-1769	6926101	6138753	11%
1770-1809	9267086	6961539	25%

Table 8 does not allow for migration, but this and other evidence suggests that the structure of population growth between 1539 and 1809 was N-shape in form. Population grew rapidly between 1539 and 1649, but fell sharply after the middle of the seventeenth century, before resuming significant uninterrupted growth after the 1730s.[39]

The Cambridge Group's raw data indicates that it was a fall in mortality rather than a rise in fertility that was responsible for eighteenth century population growth.

[38] Ibid, 537-552.

[39] See Chambers (1965), 331; Eversley (1965), 404, 408; Krause (1965), 195.

Table 9: English Baptism and Burial Rates (Per 1000) in England Calculated from Cambridge Group Data.[40]

Period	*Estimated Population*	*Baptism Rate*	*Burial Rate*
1701-40	5,350,000 (1721)	29.3	27.7
1741-80	6,147,000 (1761)	29.8	25.5
1781-1820	8,664,000 (1801)	29.4	20.6

It is only because Wrigley & Schofield disproportionately inflated the number of baptisms in the period 1781-1820 that they concluded that there was a rise in the crude baptism rate in this period. The raw figures do not allow for changes in age structure and other factors, including the estimates of population size and burial under-registration. The absolute levels of the baptism and burial rates were probably between a fifth and a third higher than indicated by Table 9. Given these uncertainties it is necessary to consider in detail the empirical evidence on mortality, nuptiality and fertility in the parish register period.

[40] For the sources of data on which this table is based, see Wrigley and Schofield (1981), 541-544, 549-552, 577.

Chapter 2: The History of Infant and Child Mortality in England, 1600-1850.

The most reliable way of calculating infant and child mortality rates before the advent of civil registration is to apply family reconstitution techniques to parish register data. There are however a number of difficulties with this methodology, which have been summarized by Ruggles with respect to the Cambridge Group's reconstitution research as follows:

> 'Given the complex combination of potential biases – the non-representativeness of the parishes, selection bias, censoring, and under-registration – we in general cannot be certain of the net direction or magnitude of error for any particular measure.'[41]

There were twenty-six parishes included in the Cambridge Group's reconstitution sample, but for the analysis of infant and child mortality there were only eight parishes covering 1790-1837, a period of rapidly expanding population. The eighteen parishes were excluded not on the basis of independent tests, but on subjective judgment and overall assessment of the quality of the evidence.[42] The following summary accounts for six of the parishes illustrate the nature of this selection process:

> '*Aldenham* – there was … an exceptionally sharp drop in infant mortality between 1750-99 and 1800-49 (from 140 to only 57 per 1000) … substantial under-registration of deaths must have occurred and 1789 was chosen as the closing date.
> *Austrey*… since the level of infant mortality also fell to an implausibly low level (from 100 per 1000 in 1700-49 to 47 per

[41] Ruggles (1992), 127.
[42] Wrigley, Davies, Oeppen and Schofield (1997), 32-38. See also Razzell (2007), 50-52.

1000 in 1750-99) it seemed prudent to disregard the post-1750 period.

Bridford – The completeness of registration appears to have deteriorated in Bridford towards the middle of the eighteenth century … these signs of deficiency suggest that the reconstitution post-1750 is significantly less complete than earlier.

Colyton – there appears to have been a weakening in burial coverage towards the end of the eighteenth century. It here seems prudent to use 1789 as the stopping date.

Hartland – There is … nothing implausible in the early eighteenth century level of infant mortality revealed by reconstitution, but its subsequent fall must reflect deteriorating registration. It would therefore be foolhardy to include the period after about 1770.

Terling – the number of burials over the … decades (1770-9 to 1820-29) changed so implausibly, so as to cause distrust in any tabulations based on data after 1789.'[43]

The language used in these passages to justify the exclusion of evidence – 'implausible', 'prudent', 'appears', 'suggest', 'foolhardy', 'distrust', – indicates the subjective nature of the selection process. However, the same-name technique allows an objective measure of burial register reliability, stated in advance and independent of any arbitrary assumptions. The following table summarises reconstitution data using the same-name method for 18 English parishes – 9 of which are from the Cambridge Group's reconstitution sample – covering the period 1600-1839.

[43] Wrigley, Davies, Oeppen and Schofield (1997), 32-38.

Table 10: Infant and Child (1-4) Mortality (per 1000) in Eighteen English Parishes, 1600-1837.[44]

Period	*Infants at Risk*	*Children at Risk*	*Same Name Ratios*	*IMR*	*CMR*
1600-49	16543	12414	965/642	158	113
1650-99	13723	10266	959/689	151	106
1700-49	14884	10747	1241/1014	181	106
1750-99	17697	13035	1143/841	148	100
1800-39	19082	12922	758/565	104	85

Infant mortality rose in the first half of the eighteenth century, before falling steadily after the middle of the century, whereas child mortality was fairly constant before reducing in the second half of the century. Although infant mortality nearly halved between1700-49 and 1800-39, some of this may have been the result of lengthening birth-baptism intervals in the late eighteenth and early nineteenth century, resulting in more infants dying before baptism.[45]

[44] The parishes are: Alcester, Warwickshire; Aldenham, Hertfordshire; Arrington, Cambridgeshire; Austrey, Warwickshire; Banbury, Oxfordshire; Barton-in-the-Clay, Bedfordshire; Bedford St. Cuthberts, Bedfordshire; Bedford St. Johns, Bedfordshire; Bedford St. Marys, Bedfordshire; Beeley, Derbyshire; Bottesford, Lincolnshire; Bridford, Devonshire; Chalgrave, Bedfordshire; Colyton, Devonshire; Great Oakley, Essex; Odiham, Hampshire; Sandy, Bedfordshire; Youlgreve, Derbyshire. I would like to thank Gill Newton for providing the original Cambridge Group schedules for reconstitution parishes.

[45] Wrigley, Davies, Oeppen and Schofield (1997), 229; Razzell (1994), 104, 105. From research on birth-baptism intervals and infant mortality, it is estimated that a maximum of 5% of children died before baptism in the period 1761-1834. However, many 'sickly' children were privately baptised, reducing mortality before baptism. See Razzell (1994), 106, 107. Given children dying before baptism, the infant mortality rate for 1820-39 in Table 11 – 116 per 1,000 – is probably fairly representative of

More detailed evidence is available for the 18 reconstitution parishes on the more exact timing of the reductions in infant and child mortality in the eighteenth and nineteenth centuries.

Table 11: Infant and Child (1-4) Mortality (per 1000) in Eighteen English Parishes, 1600-1837.[46]

Period	*Infants at Risk*	*Children at Risk*	*Same Name Ratio*	*IMR*	*CMR*
1600-19	6550	4890	362/243	165	96
1620-39	6943	5253	419/272	162	127
1640-59	5283	3990	320/216	131	116
1660-79	5486	4074	390/279	143	107
1680-99	6004	4473	433/321	165	105
1700-19	5667	4126	429/342	177	107
1720-39	6227	4392	561/470	190	104
1740-59	6171	4604	471/368	161	107
1760-79	7019	5143	498/375	153	107
1780-99	7497	5517	425/300	143	91
1800-19	9032	6690	394/286	103	83
1820-39	10050	6232	364/279	116	88

After a period of stability between 1600 and 1639, infant mortality fell in the period 1640-59 before increasing progressively to a peak in 1720-39. It subsequently reduced significantly to a low level in the nineteenth century, although there appears to have been a slight

national mortality rates in the 1830s when civil registration was introduced, particularly in parishes outside of large towns.

[46] For the parishes in the sample see footnote 44.

increase in the period 1820-39.[47] Child mortality grew in the first half of the seventeenth century but remained more-or-less constant for most of the eighteenth century, before reducing somewhat in the period 1780-1799 and stabilizing in the nineteenth century.

A number of other studies have been carried out on infant and child mortality which found a significant reduction of mortality in the eighteenth century, but all have lacked an objective method of measuring burial registration reliability.[48] One of the most comprehensive studies on infant mortality is that carried out by R.E. Jones on 60 North Shropshire rural parishes. His conclusion on burial registration was as follows:

> 'Throughout the period 1561 to 1810 the registers of adjoining and very similar parishes often yielded different burial rates. A substantial proportion of these rates were so low as to be very unlikely in a pre-industrial society and low when compared with nineteenth century civil registration figures for the same area. The most probable explanation of this was that a large number of clergy and parish clerks failed to keep a full record of infant deaths, while a minority kept a very full record.'[49]

In order to address this problem, Jones decided to select 'good registers' for his research, and used a method of linking estimated number of infant burials with the number of baptisms. He found that infant mortality rose in the late seventeenth century and fell significantly in the eighteenth – nearly halving by the early nineteenth century. However, the absence of an objective method

[47] The turning point occurred in the 1750s: infant mortality fell from 174 per 1000 in 1740-49 to 149 per 1000 in 1750-59.
[48] There are a number of historical studies of infant and child mortality which suffer from the same difficulty. See Jones (1980); Landers (1991); Houston (1992); Huck (1994); Dobson (1997); Galley (1998).
[49] Jones (1980), 240.

for correcting burial under-registration means that the timing of the above changes must be subject to a measure of uncertainty.

The samples covered by Tables 10-11 do not include any northern parishes or large towns, and under-represent industrial villages.[50] Infant and child mortality was much higher in large towns than in rural and provincial parishes. The infant and child mortality rates in the 18 reconstitution parishes in 1650-1699 were 151/1000 and 106/1000 respectively; the equivalent rates in four urban parishes in a similar period were 304/1000 and 237/1000. [51] Urban infant and child mortality was twice of that in rural and provincial parishes in the late seventeenth century, but by the nineteenth century the average infant mortality rate in these urban areas had reduced to 179 per 1000,[52] an even greater fall than that which occurred in the more rural parishes in Tables 10 and 11 in the same period.

However, there is some evidence to indicate that infant mortality grew in some urban and industrial parishes in the first half of the nineteenth century,[53] although the scale of reductions during the eighteenth century in London, Norwich, Ipswich and

[50] A reconstitution study of Ackworth in Yorkshire for the period 1687-1812 indicates that the pattern of infant and child mortality was similar to that in Table 10, although at a somewhat lower level. The figures are as follows: 1687-1749: IMR: 166, CMR: 114; 1750-1812: IMR: 82, CMR: 77. The numbers of infants at risk are: 1687-1749: 596, 1750-1812: 1,133; children at risk: 1687-1749: 431, 1750-1812: 776; same name ratios: 1687-1749: 31/21, 1750-1812: 28/23.

[51] Three hundred cases of infants at risk were selected from each of the four urban parishes: St. James Norwich (1681-1705), St. Alphage Canterbury (1681-1705), St. Peter and St. Nicholas Ipswich (1660-1709), and St. Swithin London (1675-99).See Razzell (2007), 75, 76. The 18 parishes are listed in footnote 44.

[52] The infant mortality rates in 1838-44 in these towns were as follows: City of London: 151/000; Canterbury: 153/1000; Ipswich: 171/1000; Norwich: 240/1000. See the *Registrar-General's Eighth Report*.

[53] See Armstrong (1981); Huck (1994); Szreter and Mooney (1998).

Canterbury greatly outweighed the relatively modest increases in urban areas in the nineteenth century.

The pattern of infant and child mortality in the most important urban area – London – is indicated by the results of reconstitution studies of 16 City of London parishes in the period 1539-1849.

Table 12: Infant and Child (1-4) Mortality (per 1000) in Sixteen London Parishes, 1539-1849.[54]

Period	*Infants at Risk*	*Children at Risk*	*Same Name Ratio*	*IMR*	*CMR*
1539-99	839	616	48/31	155	168
1600-49	1073	770	83/52	238	224
1650-99	1020	686	99/67	256	282
1700-49	704	387	68/39	409	176
1750-99	720	435	60/36	263	270
1800-49	199	102	8/4	141	118

Some of the sample sizes are small, particularly for the nineteenth century – although the infant and child mortality rates are similar to the mortality levels for the City of London established by the Registrar-General after 1837.[55] Infant mortality more than doubled in the period 1539-1749, before falling very sharply after the middle of the eighteenth century. There was a similar pattern in child mortality, except for the rise in mortality in the second half of the eighteenth century. This is an unexpected result and would require larger samples covering more parishes to evaluate these levels of mortality.

[54] For details of the parishes included in the sample see Razzell (2007), 13, 134.
[55] See footnote 52.

The findings on infant and child mortality in the sixteenth and early seventeenth century are supported by research carried out by Finlay on eight London parish registers in the period 1580-1650. He found an average raw rate of infant mortality of 191 per 1000,[56] which is consistent with the rates for 1539-1649 in Table 12. Finlay inflated the raw mortality rates to allow for burial under-registration, but he recognised that his correction ratios involved a degree of arbitrariness.

The data from the London Bills of Mortality suggests that the proportion of children dying under the age of two declined rapidly in London from the 1750s onwards: the number of children dying under the age of two as a proportion of the number of baptisms was as follows: 1730-39: 60%; 1740-49: 61%; 1750-59: 51% 1760-69: 33%; 1770-79: 33%; 1780-89: 38%; 1790-99: 26%; 1800-09: 22%; 1810-19: 20%.[57] By the middle of the nineteenth century infant and child mortality levels were not significantly different in London than elsewhere.[58]

There is very little available information on detailed changes in urban child mortality in the eighteenth century, but evidence from the Northampton Bills of Mortality suggests that this form of mortality in the town did not reduce until the end of the eighteenth century. The number of children dying under the age of two as a proportion of the number of baptisms was as follows: 1740-49: 44%; 1750-59: 35%; 1760-69: 49%; 1770-79: 45%; 1780-89: 38%; 1790-99: 26%; 1800-09: 22%; 1810-19: 20%.[59] The fall in child mortality at the end of the eighteenth and beginning of the nineteenth century is similar to what occurred in the rural and provincial parishes detailed in Table 11.

One way of further exploring the factors shaping infant and child mortality is to analyse the relationship between socio-

[56] Finlay (1981), 30.
[57] Razzell (2007), 110.
[58] See the *Registrar General's Eighth Report.*
[59] Razzell (2007), 110.

economic status and mortality. The following table summarises data from 17 Cambridge Group reconstitution parishes, where an elite family – aristocrat, esquire, gentleman, clergyman, lawyer or physician – is matched with the next non-elite entry in the baptism register.[60] This ensures the control of place, an important dimension in all mortality studies.

Table 13: Infant and Child (1-4) Mortality (Per 1000) amongst Elite and Control Families in Seventeen Cambridge Group Parishes, 1600-1799.[61]

Period	*Elite Families*		*Control Families*	
	IMR	CMR	IMR	CMR
1600-49	134	120	184	117
1650-99	158	143	180	132
1700-49	177	106	223	146
1750-99	113	69	159	134

Infant mortality levels were lower in all periods amongst elite than control families, although the pattern of rising and falling mortality is the same in both groups. Child mortality levels were similar in the elite and control population in the seventeenth century, but

[60] Where occupational information was available, most of the control group were labourers, husbandmen and artisans.

[61] The parishes are those listed in footnote 12, plus the parishes of Reigate and Shepshed. The numbers of infants and children at risk are as follows (the same name ratios in brackets): Elite families, 1600-49: IR: 1019, CR: 795 (80/61); 1650-99: IR: 1075, CR: 800 (76/63); 1700-49: IR: 905, CR: 620 (68/65); 1750-99: IR: 473, CR: 337 (28/23). Control Families: 1600-49: IR: 1131, CR: 883 (85/52); 1650-99: IR: 1130, CR: 863 (90/64); 1700-49: IR: 1048, CR: 787 (123/95); 1750-99: IR: 473, CR: 337 (59/41). There are insufficient numbers in the 1800-49 samples to enable reliable analysis.

diverged sharply in the eighteenth century when mortality fell rapidly amongst the elite but not in the control group.[62]

A study comparing evidence on eighteen parishes in Boyd's *Inhabitants of London* with the returns of the Marriage Duty Act yields information on wealth and infant/child mortality in 1681-1709 as follows:

Table 14: Infant and Child Mortality (1-4) Rates (per 1000) amongst London Wealth and Non-Wealth Holders, 1681-1709.[63]

Socio-Economic Status	*Infants at Risk*	*Children at Risk*	*Same Name Ratios*	*IMR*	*CMR*
Wealth Holders	611	448	61/46	284	184
Non Wealth Holders	642	424	81/51	384	232

Both infant and child mortality were highest amongst non-wealth holders at this time, although these forms of mortality were still high amongst wealthy families, with nearly a half of their children dying under the age of five. The pattern was similar in the town of Liverpool, with both infant and child mortality highest in the poorest occupational group – mariners and labourers – although the differences were not as significant as they were in London.

[62] For a similar pattern of mortality amongst elite and control families in Bedfordshire, see Razzell (2007), 133.
[63] For full details of this data see Razzell and Spence (2007), 276.

Table 15: Infant and Child (1-4) Mortality Rates (per 1000) by Occupational Group in Liverpool, 1675-1749

Occupational Group	*Infants at Risk*	*Children at Risk*	*Same Name Ratios*	*IMR*	*CMR*
Gentlemen, Merchants, Professionals	968	556	79/55	187	217
Tradesmen, Artisans	3889	1980	300/149	188	229
Mariners, Labourers	2631	2536	199/108	205	278

By contrast in the town of Truro in Cornwall during the period 1629-1749, infant mortality was actually higher in the elite than the rest of the population, with little difference in child mortality.[64]

Table 16: Infant and Child (1-4) Mortality Rates (per 1000) by Socio-Economic Status in Truro, Cornwall, 1629-1749.

Socio-Economic Status	*Infants at Risk*	*Children at Risk*	*Same Name Ratios*	*IMR*	*CMR*
Gentlemen, Merchants, Professionals	694	396	86/72	287	272
Rest of the Population	2539	1587	259/206	235	289

The link between socio-economic status and infant & child mortality was clearly a complex one. By the mid-nineteenth century there is evidence that there was little or no association between status and mortality levels in London. The Registrar-

[64]For the source of these figures see Razzell (2007), 111.

General published figures of mortality by the mean rateable value of registration districts for the period 1839-44, which are summarized as follows:

Table 17: Infant, Child and Adult Mortality in London by Rateable Value of Registration District, 1839-44.[65]

Registration Districts	*Mean Annual Value of Rated Property*	*IMR*	*CMR*	*Adult (25-44) Male Mortality per 1000*
10 Districts With Lowest Rateable Value	£15	153	52	13
10 Districts With Medium Rateable Value	£26	168	59	15
10 Districts With Highest Rateable Value	£58	167	58	13

This lack of an association between socio-economic status and infant mortality is supported by evidence on Quakers, who by the nineteenth century were mainly wealthy merchants and professionals. The infant mortality rate amongst Quakers in London in 1825-49 was 150 per 1000, similar to the rate amongst the total population in equivalent registration districts in 1838-44.[66]

In some areas outside of London, child and adult mortality in the 1850s were higher in wealthy districts than poor ones. Using Registrar-General's reports, four registration districts known for their wealth – Bath, Cheltenham, Richmond and Brighton – were

[65] See Razzell (2007), 136.
[66] See Landers (1991); Razzell (2007), 137.

selected and matched with four poor areas in the same counties – Clutton, Westbury, Hambledon, and Hailsham.[67]

Table 18: Average Annual Child and Adult Mortality per 100 Living in Wealthy and Poor Registration Districts, 1851-60.[68]

Registration District	*Child (<5) Mortality Rate*		*Adult (35-44) Mortality rate*	
	Males	*Females*	*Males*	*Females*
Bath, Somerset	6.866	5.761	1.667	1.097
Clutton, Somerset	4.908	4.120	0.759	0.883
Cheltenham, Gloucstershire	6.029	5.268	1.212	1.026
Westbury, Gloucestershire	4.979	4.449	0.821	0.931
Richmond, Surrey	6.128	5.325	1.435	1.125
Hambledon, Surrey	3.755	3.232	0.834	1.073
Brighton, Sussex	8.098	6.998	1.579	1.224
Hailsham, Sussex	4.506	3.319	0.797	1.143

Both child and adult mortality rates were lower in the poor than in the wealthy districts, particularly amongst males. The gender differences may have been partly the result of the large number of domestic servants in the wealthy areas. The variations in mortality were probably largely a function of disease environment, with the

[67] See page 83 for the socio-economic characteristics of these districts.
[68] For the source of this data see the *Supplement Registrar-General's.*

wealthy districts being mainly urban and the poor districts largely rural.

To summarize, after a period of stability between 1600 and 1639, infant mortality fell during the two decades between 1640 and 1659, before increasing progressively to a peak in 1720-39. It subsequently reduced from the 1740s onwards, nearly halving between the middle of the eighteenth and nineteenth centuries. Child mortality increased in the first half of the seventeenth century but remained more-or-less constant for most of the eighteenth century, before falling somewhat in the period 1780-1819. In London and in other urban areas there were marked falls in both infant and child mortality. Child mortality amongst the wealthy reduced in rural and provincial areas at an earlier period – from the beginning of the eighteenth century onwards – than it did among the general population.

It is less clear what the influence of socio-economic status was on urban infant and child mortality, and in London by the mid-nineteenth century there appears to have been little or no association between poverty and these forms of mortality. Also, as we have seen, in a number of provincial districts mortality was significantly lower in poor than in wealthy areas in the 1850s.

The general timing and extent of reductions in early childhood mortality cannot fully explain the scale of population increase in the eighteenth century. For a full explanation of this surge in population growth we must look elsewhere.

Chapter 3: The History of Adult Mortality in England, 1600-1850.

There are major problems with adult mortality data from reconstitution research. As the samples are selected from individuals traced from the baptism to the date of marriage (to establish the age at which an adult enters observation), only between a fifth and a quarter are included in the Cambridge Group's initial reconstitution sample on adult mortality. This proportion further diminishes as a result of people being lost from observation, and the final group on which calculations of adult mortality are based, includes only between 8.6% and 10.2% of the total sample.[69] Such small minorities are unlikely to be representative, either sociologically or demographically. Evidence exists to show that migrants had significantly different demographic characteristics from non-migrants.[70] Additionally, migrants tended to be labourers or members of other poor socio-economic groups, whereas non-migrants were more likely to be farmers, shopkeepers and property-owners.[71]

As we have seen earlier, an additional problem is variations in burial registration reliability. There is also the difficulty of establishing accurate nominal record linkages between baptisms/marriages and subsequent burials, as most parish registers only list the names of people buried without further identifying information. This is a particular problem with adult deaths as there are frequently long gaps between baptisms/marriages and burials. It is for all these reasons that it is necessary to look elsewhere for reliable and meaningful evidence on adult life expectancy, and fortunately there are a number of sources which allow both the study of national mortality patterns and the triangulation of data.

---

[69] These figures are calculated from data cited in Ruggles (1992), 522.
[70] Kasakoff and Adams (1995).
[71] Souden (1981), 250, 254, 310; Razzell (1994), 180.

In the year 1710 the government introduced a national tax on apprenticeship indentures – the Inland Revenue Register (INR Register) – which was in existence until the early nineteenth century. Details of these indentures have survived and are currently being digitised by the Society of Genealogists.[72] The indentures in the early period provide the following information on fathers: name, place of residence, occupation, and whether or not they were alive or dead. Additionally the name of the apprentice was recorded along with the amount paid for the indenture. There was however widespread tax avoidance, with many indentures not registered for tax purposes.[73] Comparing information on fathers' mortality status in London trade apprenticeship registers with that in the INR Register, suggests that the recording of the death of fathers was relatively accurate for the period 1710-13, but began to deteriorate somewhat after that date.[74] However, even in 1710-13 an examination of the consistency of recording the death of fathers – by comparing statements made about different apprentices to the same father at different dates – suggests that at least 5% of deaths were not recorded.[75]

---

[72] I would like to thank the Society of Genealogists for making available the digital version of the INR Register, covering the surnames beginning with the letters A to M.

[73] For example, of 85 indentures listed in the Grocers' company register for the period 1710-25, only 33 – 39%– were included in the tax register. See Webb (2008) and the INR Register.

[74] The city trade company registers were for tylers & bricklayers, masons, plumbers, vintners, and grocers. See Webb (1996), (1999), (2000), (2006), (2008). There were 13 cases in the period 1710-13 in which information on fathers' mortality status was identical in Webb and the INR Register, whereas between 1714 and 1724 there were 8 deaths out of a total of 85 (9.4%) listed in Webb but not in the INR Register.

[75] There were 2 inconsistent statements in a sample of 45 cases.

Table 19: Paternal Mortality per 1,000 in English Regions, 1710-13. (Number of Cases in Brackets)[76]

Region	*Proportion of Fathers Dead*	*Mean Age of Apprentices in Years*	*Estimated Annual Paternal Mortality*
London, Middlesex	37% (372)	15.2	24.3
Surrey, Kent, Hampshire, Sussex	35% (234)	15.2	23.0
Bedfordshire, Berkshire, Buckinghamshire, Hertfordshire, Northamptonshire, Oxfordshire	28% (206)	15.9	17.6
Cambridgeshire, Essex, Lincolnshire, Huntingdonshire, Norfolk, Suffolk	32% (355)	15.1	21.2
Cornwall, Devon, Dorset, Gloucestershire, Herefordshire, Shropshire, Somerset, Wiltshire, Worcestershire	30% (411)	15.3	19.6
Total England	32%	15.3	20.9

[76] Data calculated from the INR Register surname letters A-M for the period 1710-13. See Razzell (2007), 101. The number of cases used for the calculation of the mean ages of apprentices is in sequence as follows: 86; 64; 59; 95; 148; 95.

There was no linear variation in mortality levels between the different regions, although the number of fathers dead in London & Middlesex was significantly higher than in the Bedfordshire and adjoining counties. Tracing the baptisms of 548 apprentices in the International Genealogical Index (I.G.I.) reveals that there was little difference between the different regions in their mean ages, which represents the period at risk of their fathers dying.

There is insufficient information to calculate the average ages of fathers by region, but it was possible to trace 188 for a limited sample of fathers in the I.G.I. The mean age of this sample was 34.3 years, with 72% (135 of 188) in the 25-44 age range. It is possible to calculate an annual rate of mortality of fathers by dividing the proportion of dead fathers – 32% – by the average age of apprentices – 15.3 years.[77] This yields an annual mortality rate for England of 20.9 per 1000 in 1710-13, which can be compared to figures published by the Registrar-General for the age group 25-44 in the period 1838-42 – 11 per 1000.[78] There are various uncertainties involved in these calculations, but they indicate that there was a major long-term fall in male adult mortality between the beginning of the seventeenth and middle part of the nineteenth century – nearly halving in that period.

There is other evidence to support the conclusion that male adult life expectancy was low at the beginning of the eighteenth century and earlier. During a period of civil registration in 1654-60, 226 of 380 spinsters and bachelors married in Lancashire and Yorkshire had fathers who were dead at the time of marriage – 59.5%.[79] According to a sample of 103 cases traced in the I.G.I., the average age of marriage of bachelors and spinsters was 26.2

[77] This was the mean age of apprentices for a large sample of 696 cases for the period 1710-14.
[78] Mitchell and Deane (1971), 38.
[79] Razzell (2007), 84.

years,[80] yielding an annual paternal mortality rate of 22.7 per 1000 (59.5/26.2), higher than the 20.9 per 1000 found in the INR Register national sample in 1710-13.

Marriage licence data is one of the most fruitful sources of information on paternal life expectancy, because parental permission was required by law for men and women marrying under the age of twenty-one. Some marriage licences – such as those registered by the Vicar General – required personal affidavits confirming parental consent, and where a father was dead, permission had to be granted by widows and guardians. The following table summarizes evidence on marriages that occurred in different regions of England.[81]

[80] The average age of 53 spinsters was 25.1 years, of 50 bachelors 27.3 years.

[81] The period covered by the East Kent data is for 1619-46. For a discussion of the marriage licence data, including that on East Kent, see Razzell (2007), 79-81. The data on London and the South of England was compiled from Vicar General's marriage licences in the Society of Genealogists' Library. The analysis of the Durham material is based on marriage licences in the Church of Latter Day Saints Library, and that for East Kent is supplemented by marriage licences in the Canterbury Cathedral Archive. The total number of cases is as follows: London: 4,928; Southern England: 1,958; East Kent: 5,373; Durham: 1,204.

Table 20: Fathers of Spinsters Under Twenty-One: Proportions Dead in English Regions, 1600-1799.

Period of Marriage	*London*	*South of England*	*East Kent Diocese*	*Durham Diocese*
1600-46	46%	40%	47%	-
1661-99	47%	44%	43%	-
1700-09	48%	47%	50%	-
1710-19	47%	44%	48%	-
1720-29	45%	39%	48%	-
1730-39	46%	39%	34%	-
1740-49	55%	45%	37%	42%
1750-59	40%	41%	27%	28%
1760-69	35%	35%	22%	27%
1770-79	39%	31%	24%	29%
1780-89	31%	32%	28%	25%
1790-99	31%	27%	22%	-

The average age of brides marrying under twenty-one did not change significantly during the late seventeenth and eighteenth centuries, with an average age of about 18.5 years.[82] The paternal mortality rate in the mid-seventeenth century was of the order of 23 per 1,000, similar to findings in Lancashire and Yorkshire in the 1650s. The mortality rate in 1710-19 was about 25 per 1000, greater than the rate calculated for the national sample in 1710-13 – 20.9 per 1000 – and this may be because of unrecorded deaths at this date.

Paternal mortality fluctuated somewhat between 1600 and 1720-29 in all regions, but was at an overall high level in 1600-1729. This began to change in the 1730s in East Kent, with sharp reductions which did not occur in London and the South of

[82] It was 18.5 years in both 1687-94 and 1780-81, figures based on the first 100 cases from the Vicar General's marriage licences in these two periods.

England until the 1750s. This is similar to the pattern in Durham, although there is no data available for this diocese before the 1730s. According to Table 20, male adult mortality nearly halved in all regions in the eighteenth century, and as the figures relate to fathers who were alive on average eighteen-and-a half years before the marriage of their daughters, mortality first began to fall in East Kent between 1710 and 1730, and in London, the South of England and Durham between 1730 and 1750. Most of the gains in life expectancy took place in the first half of the eighteenth century, but there were some modest falls in paternal mortality in the second half of the century.

The pattern of falling mortality is confirmed by other evidence, such as Landers' study of London, and Hollingsworth's research on the peerage.[83] Also, from marriage licence evidence for Nottinghamshire, it is estimated that paternal death rate reduced from 22 per 1,000 in 1661-63 to 14 per 1,000 in 1754-58, and 10 per 1,000 in 1791-93.[84] Increasing adult life expectancy in the eighteenth century can be tracked for apprentices becoming freemen of the Merchant Adventurers Company in Newcastle-On-Tyne. The mean number of years lived after admission increased from 21.1 years in 1660-79 to 30.3 years in 1760-79.[85] Fathers of masons' apprentices in London came from many areas of the country, and the proportion dead at the date of indenture of their sons was as follows: 1663-99: 42%; 1700-49: 33%; 1750-1805: 21%.[86] As the mean age of apprenticeship was about 15 years, these figures indicate a higher level of mortality than found elsewhere in the earlier period, but the halving of mortality in the eighteenth century is similar to that depicted in Table 20.

---

[83] Landers (1993); Hollingsworth (1965).
[84] Razzell (2007), 83.
[85] The quality of the information appears to be high, giving full information on dates of admission and death for between 61% and 80% of cases. See Dendy (1899).
[86] Razzell and Spence (2007), 283.

Most of the 289 parishes in East Kent were small rural villages, suggesting that the environmental and cultural improvements first occurring in urban areas were not responsible for increasing male adult life expectancy.[87] This is consistent with findings about the relationship between socio-economic status and adult mortality. The information on occupation and the level of premium paid in the INR Register allows an analysis of socio-economic status and paternal mortality in the early eighteenth century. There was an association between occupation and premium paid, illustrated by the following figures:

Table 21: Mean Levels of Premium Paid by Father's Occupation, INR Register 1710-25.[88]

Occupation	*Number of Cases*	*Mean Premium Paid*
Gentlemen	2111	£48.1
Merchants	326	£47.3
Clerks (Clergymen)	426	£37.7
Farmers	169	£14.0
Yeomen	2455	£13.9
Husbandmen	541	£8.1
Labourers	607	£5.7

Generally there is a link between the socio-economic status of an occupation and the mean premium paid, and the occupational groups with the highest status – gentlemen and merchants – paid about seven times more than the lowest status groups – husbandmen and labourers.

The relationship between premium paid and paternal mortality is indicated by Table 22.

[87] For these improvements see Jones and Falkus (1990).
[88] The data is based on surnames beginning with A-M in the period 1710-25.

Table 22: Mortality amongst Fathers Listed in the INR Register 1710-13 by Amount of Premium Paid.[89]

Premium Paid	*Number of Cases*	*Proportion of Fathers Dead*
£1-£5	541	23%
£6-£19	587	30%
£20+	532	34%

Table 22 suggests a negative association between wealth and adult mortality among apprentices' fathers, although it does not allow for possible age differences in the three premium groups. Baptism dates of the apprentices were traced in the International Genealogical Index, and the mean ages by premium category were as follows (number of cases in brackets): £1-£5: 15.2 years (231); £6-£19: 15.0 years (267); £20+: 16.0 years (196). These ages represent the period of risk of fathers dying, and dividing the proportions of dead fathers by the mean ages of their sons yields the following figures: £1-£5: 1.51; £6-£19: 2.01; £20+: 2.13. The inverse gradient between wealth and paternal mortality still exists in these revised figures, although they do not take account of fathers' ages. A small sample of fathers' baptisms traced in the I.G.I. suggests these were not significantly different: the mean age of 94 fathers paying premiums of £1-£9 was 33.5 years, and for 94 fathers paying £10 and above it was 35.1 years.

The link between wealth and life expectancy might be partly explained by the wealthy living more frequently in London and other towns and cities, but even within those areas there was an association between premium paid and mortality levels.

[89] For the source of the data in Tables 22 and 23 see the INR Register, Volumes 1-6.

Table 23: Mortality amongst London Fathers Listed in the INR Register, 1710-13.

Premium Paid	*Number Of Cases*	*Proportion Of Fathers Dead*
£9 And Under	110	32%
£10-£19	93	41%
£20+	99	42%

Although the number of cases is small, there is still the same linear inverse gradient between wealth and paternal mortality in London as found nationally. The above data suggests that at the beginning of the eighteenth century, not only was there was no significant association between poverty and adult life expectancy, but that on the contrary, mortality was higher amongst the wealthy than the poor. There is other evidence that elite adults suffered from 'the hazards of wealth' – the excessive consumption of tobacco, alcohol and a surfeit of rich food, along with a relative lack of physical activity – until the end of the nineteenth century, when the social class gradient in adult mortality appears to have emerged.[90]

It is possible to explore the link between socio-economic status and life expectancy through an analysis of the East Kent marriage licences. The relationship between husband's occupation and paternal mortality was as follows:

[90] Razzell and Spence (2006). See also Razzell (2007), 202-204 and Tables 17 and 18 above.

Table 24: Paternal Mortality amongst Fathers of Spinsters Marrying Under 21, by Occupation of Husband in East Kent, 1619-1809.[91]

Occupation	*Period*		
	1619-1646	1661-1700	1751-1809
Gentlemen, Merchants, Professionals	39%	38%	28%
Yeomen, Farmers	41%	42%	15%
Tradesmen, Artisans	46%	49%	26%
Husbandmen	50%	39%	19%
Mariners, Fishermen	42%	45%	24%

Table 24 indicates that mortality diminished amongst all social groups in the eighteenth century, but gentlemen, merchants and professionals experienced the smallest reduction and had the highest mortality at the end of the period 1751-1809. This finding might be partly a function of small sample sizes and place of residence, although it is consistent with the earlier findings about the positive association between wealth and paternal life expectancy in the early eighteenth century.

However data on Members of Parliament indicates that there were very significant falls in mortality amongst this very wealthy group in the eighteenth century.

[91] Razzell (1994), 197. For higher paternal mortality amongst gentlemen and professionals in Nottinghamshire and Sussex during 1754-1800 see Razzell (2007), 117.

Table 25: Mean Number of Years Lived by Members of Parliament, 1660-1820 (Number of Cases in Brackets).[92]

Period of First Entry	*Age at First Entry- Mean Number of Years Lived*		
	Under 29 Years	*30-39 Years*	*40 Years Plus*
1660-1690	25.7 (429)	22.6 (458)	17.9 (633)
1715-1754	30.8 (541)	28.2 (422)	18.5 (347)
1755-1789	37.1 (480)	29. 9 (354)	21.2 (431)
1790-1820	38.1 (571)	32.0 (432)	22.4 (572)

All age groups experienced mortality reductions, but the greatest mortality gains were amongst the youngest age cohort under the age of 29. There was an increase in life expectancy of over 12 years in this group, distributed evenly in the entry period between 1660 and 1789. There were also substantial gains in the 30-39 age cohort – of about 10 years – but these were mainly confined to the entry period between 1660 and 1754. There was a modest increase in life expectancy of nearly 5 years in the oldest 40+ group, which was fairly evenly spread between 1660 and 1820.

Although all the evidence considered on adult mortality is for males, Hollingsworth study of the aristocracy suggests that females experienced even more mortality reductions in the same period.

[92] Razzell (1994), 199.

Table 26: Aristocratic Expectation of Life at the Age of 25, 1650-1849.[93]

Cohort Born	*Male Expectation of Life at Age 25 Years*	*Female Expectation of Life at Age 25 Years*
1650-74	25.6	27.5
1675-99	28.1	27.3
1700-24	29.3	30.0
1725-49	34.2	33.0
1750-74	35.6	36.5
1775-99	37.1	38.6
1800-24	37.2	40.4
1825-49	38.6	44.5

Most of the gains in life expectancy occurred amongst both males and females from the second quarter of the eighteenth century onwards, similar to the pattern for males in the marriage licence data. The timing of the reduction in adult mortality was different from the falls in infant and child mortality which occurred mainly in the second half of the eighteenth century, indicating that life table models are not a reliable basis for understanding eighteenth century mortality trends.

Increasing adult life expectancy probably had a direct impact on the structure of marriage during the eighteenth century. According to marriage licence evidence for the Diocese of Canterbury in East Kent, about a third of all marriages were of widows and widowers in the seventeenth century, reducing significantly in the eighteenth.

[93] Hollingsworth (1965), 56, 57.

Table 27: Proportions of Widow and Widower Marriages in East Kent, 1619-1809.[94]

Period	*Total Number of Marriages*	*Proportion of Widow Marriages*	*Proportion of Widower Marriages*
1619-1676	2000	30%	32%
1677-1725	2000	23%	27%
1726-1780	2000	18%	19%
1781-1809	1000	12%	18%

Diminished male adult mortality may also have had an impact of the frequency of the remarriage of widows, as indicated by limited evidence for the East Kent area. The proportions of widows remarrying were as follows (number in sample in brackets): 1619-46: 49% (100); 1661-76: 51% (71); 1751-80: 10% (100); 1751-1810: 9% (100).[95] There were clearly some radical changes in nuptiality patterns in the eighteenth century, a topic to be discussed in some detail in the next chapter.

[94] For the source of this data see Razzell (1994), 217. For similar reductions in widow marriages in the eighteenth century see Wrigley and Schofield (1981), 258, 259.
[95] Razzell (2007), 66.

Chapter 4: The History of Marriage and Fertility in England, 1550-1850.

Table 9 suggests that there were no major changes in the crude baptism rate in England during the eighteenth century. Given that parish register reliability did not change significantly during this period, one way of assessing levels of fertility is to analyse the Cambridge Group's raw figures of national marriages and baptisms.

Table 28: The Ratio of Baptisms to Marriages in England & Wales, 1700-1836.[96]

Period	*Number of Baptisms*	*Number of Marriages*	*Ratio of Baptisms to Marriages*
1700-19	2968451	820249	3.62
1720-39	3186218	914810	3.48
1740-59	3368432	947807	3.55
1760-79	3912936	1155328	3.39
1780-99	4615085	1321359	3.49
1800-19	5204268	1604971	3.24
1820-36	5830266	1842712	3.16

Table 28 indicates that fertility fell during the eighteenth and early nineteenth century, and it was only because the numbers of baptisms were inflated at the end of the century by Wrigley and

[96] Wrigley and Schofield (1981), 541-43, 557-60. There is no evidence that the accuracy of marriage registration changed during the eighteenth century. The introduction of Hardwicke's Act in 1753 made no significant difference to the number of marriages registered, so that according to Wrigley and Schofield's raw figures for England & Wales, there were 236,227 marriages in 1749-53 and 239,957 in 1754-58. Wrigley and Schofield (1981), 558.

Schofield that it was concluded that fertility rose at this time. Reconstitution findings on fertility do not help resolve these difficulties because of the methodological problems discussed earlier.[97] Reconstitution research on marital fertility also does not allow for the effects of changing nuptiality levels.

The strongest evidence for a rise in fertility is data on changes in the age of marriage. The Cambridge Group found from their reconstitution research that there was a fall of 2.4 years in the period between 1675-1724 and 1780-1837.[98] The proportion of baptised children included as adults in the Cambridge Group's marriage samples varied slightly over time, ranging between 20.3 and 25.9%,[99] i.e. only between a fifth and a quarter of the total population. It is possible that some of the untraced marriages were due to clandestine or unregistered marriages, but the probability is that most of them were the result of migration out of the parish of

[97] Such research does not include changes in illegitimacy levels. According to raw data compiled by the Cambridge Group (see UK Data Archive UKDA/5397) there was an increase in illegitimacy during the eighteenth century. Data for 25 Bedfordshire parishes for the periods 1698-1726 and 1813-20 indicates that the proportions of illegitimate children recorded in baptism registers increased from 1.3% (N = 2101) to 3.4% (N = 3379). A similar analysis for five northern industrial parishes in the periods 1740-49 and 1813-20 suggests a similar increase – from 3.1% (N = 2762) to 5.9% (N = 4355). The Bedfordshire parishes are: Biddenham, Cardington, Clapham, Clifton, Eaton Bray, Henlow, Houghton Regis, Kempston, Keysoe, Langford, Little Barford, Little Staughton, Maulden, Meppershall, Odell, Podington, Potten, Pulloxhill, Renhold, Souldrop, Southill, Tilbrook, Tilsworth, Upper Gravenhust, Wrestlingworth. The northern parishes are: Calverley, Yorkshire; Downham, Lancashire; Over, Cheshire; Prestwich, Lancashire; Warrington, Lancashire.

[98] Wrigley, Davies, Oeppen and Schofield (1997), 149.

[99] I have calculated these proportions from Cambridge Group figures quoted by Ruggles (1992), 522.

birth.[100] As we saw earlier, migrants and non-migrants had very different sociological characteristics, making those included in reconstitution research unrepresentative of the total population.

Marriage licences include information on both natives and migrants, which partly addresses this problem. Marriage by licence was more expensive than marriage by banns, but the proportion of the population varied between 30 and 90%.[101] Although the licences did not always cover a majority of the population and tended to exclude the poorest section of the population, they did cover a very wide socio-economic range, from husbandmen, fishermen, artisans, farmers, to professionals and gentry. Marriage licences form a significantly higher proportion of population in the pre-1750 period than that included in the Cambridge Group's reconstitution sample – covering a minimum of 30% compared to the average reconstitution figure of between 20 and 26%.[102]

The mean average age at marriage of spinsters marrying by licence in six counties – Yorkshire, Kent, Nottinghamshire, Suffolk, Wiltshire and London – was 23.8 years in the period 1660-1714,[103] significantly lower than the equivalent figure in the reconstitution sample for 1675-1724, 26.4 years.[104] The mean age of first marriage of women marrying in 1839-41 in England and Wales according to Registrar-General's figures was about 24.3 years.[105] The marriage licence figures suggest that there was a slight long-term rise in average marriage ages of about 0.5 years, contradicting the finding from the reconstitution study of a fall in age of marriage of 2.1 years.

There is however a more significant problem with evidence on nuptiality, which is the lack of information on the proportion of

[100] See Ibid for a general discussion of this issue.
[101] Razzell (2007), 62, 63.
[102] Ruggles (1992), 522.
[103] Razzell (1994), 83.
[104] Wrigley, Davies, Oeppen and Schofield (1997), 149.
[105] *Registrar-General's Fourth Annual Report,* 8.

women ever married. It is not possible with reconstitution methodology to create this type of data, and this was recognized by Wrigley and Schofield when they wrote that it was 'particularly disappointing that English reconstitution material yields no material about changes in proportions of men and women never married.'[106] In their later work, Wrigley and colleagues concluded 'that until the middle of the eighteenth century the substantial swings in nuptiality were produced almost exclusively by wide variations in the proportion of women never marrying.'[107]

Fortunately additional sources are available which allow an analysis of proportions of women ever marrying, as well as the ages at which they married. Long-term information on Lichfield, Stoke-on-Trent and Chilvers Coton at the end of the seventeenth century, compared to census data for the same parishes in 1851 reveals the following pattern:

Table 29: Proportion of Single Women in Lichfield Staffordshire, Stoke-on-Trent Staffordshire and Chilvers Coton Warwickshire 1684-1701 and 1851. (Total Number of Cases in Brackets).

	1684-1701	*1851*
Age Group	*Proportion Single*	*Proportion Single*
15-24	91% (522)	90% (511)
25-34	36% (445)	37% (401)
35-44	12% (348)	19% (305)
45+	4% (504)	16% (594)

Little change is evident in the number of single women in the age groups 15-24 and 25-34, but Table 29 indicates that there were significant reductions in the proportion of women ever marrying

[106] Wrigley and Schofield (1981), 11, 195.
[107] Wrigley and Schofield (1989), xix.

above the age of thirty-five.[108] This table only covers three parishes at limited periods of time, but information is also available on six late eighteenth century parish censuses which can also be compared with the 1851 Census in those parishes.

Table 30: Proportion of Single Women in Ardleigh, Astley, Cardington, Corfe Castle, Wembworthy and Wetherby, 1776-96 and 1851.[109]

	1776-96	*1851*
Age Group	*Proportion Single*	*Proportion Single*
15-24	85% (388)	87%
25-34	29% (290)	33%
35-44	11% (200)	14%
45+	8% (339)	10%

[108] The quality of data for the censuses in 1684-1701 is high, with only a small minority of cases without full information on marital status and age: in Lichfield 64 out of a total of 1079 cases – 6%; in Stoke-on-Trent 19 out of 514 – 4 %; and Chilvers Coton 11 out of 274 – 4%. The seventeenth century data is compiled from copies of the 1684 census of Chilvers Coton, Warwickshire, the 1695 census of Lichfield, Staffordshire, and the 1701 census of Stoke-on-Trent, Staffordshire, in the Cambridge Group Library. The 1851 figures are taken from the *1851 Enumeration Census (Online),* based on a one-in-two sample for Lichfield, a one-in-four sample for Stoke-on-Trent, and the complete census of Chilvers Coton.

[109] The 1776-96 data is compiled from the census schedules in the Cambridge Group Library, the 1851 figures are taken from the *1851 Enumeration Census (Online)*. The dates of the censuses for 1776-96 were as follows: Wetherby, Yorkshire 1776; Wembworthy, Devonshire 1779; Cardington, Bedfordshire 1782; Astley, Warwickshire 1782; Corfe Castle, Dorsetshire 1790; Ardleigh, Essex 1796.

There was a slight increase in the proportion of single women in all age groups between 1776-96 and 1851, which is consistent with the findings of Table 29.

Burial registers frequently include information on the marital status of women, and the Bedfordshire Family History Burial database allows an analysis of a number of parishes with relatively full information on such status.

Table 31: Proportion of Spinsters Listed in Twenty-Three Bedfordshire Burial Registers, 1695-1704 and 1795-1804.[110]

Period	*Number of Spinsters*	*Total Known Cases*	*Proportion of Spinsters*
1695-1704	26	817	3%
1795-1804	90	853	11%

The above Table covers the same parishes in the two listed periods, and although information was relatively full, there were a number of unknown cases in both periods.[111] Also, women listed as daughters were excluded from the analysis,[112] and for 192 cases with information on age in 1795-1804, 27 – 14 per cent – were daughters aged between 15 and 29. Table 31 therefore under-states the number of single women, and does not include a breakdown of

[110] The parishes are : Arlesey, Aspley Guise, Astwick, Bletsoe, Bedford St. Paul, Caddington, Chellington, Clophill, Cople, Cranfield, Carlton, Dean, Dunton, Eaton Bray, Elstree, Eyeworth, Farndish, Flitton, Goldington, Houghton Conquest, Henlow, Knotting and Luton. The first period was chosen because it was the time of the Marriage Duty Act and the second because it was 100 years later. The parishes were selected alphabetically, choosing the first 23 with good information in both periods.

[111] The number of unknown cases in 1695-1704 is 817 and 853 in 1795-1804.

[112] There were 1,365 daughters – out of a total of 2,294 (59.6%) – in the first period, and 1,325 out of 2,287 (57.9%) in the second.

the data by age, but the trend is nevertheless towards increasing numbers of single women in the eighteenth century.

However, Tables 29-31 only refer to a small number of parishes at limited periods of time, but information on female deponents in church courts includes material on much larger numbers of parishes from the early sixteenth century onwards. Detailed information is available on Sussex depositions for the period 1593-1694, and it is possible to make a long-term analysis by comparing this evidence with that of the 1851 Sussex census.

Table 32: Proportion of Single Women in Sussex, 1593-1694 (Total Number of Cases in Each Age Group in Brackets) and in the Sussex 1851 Census.[113]

Age Group	*Sussex, 1593-1694*	*Sussex, 1851 Census*
15-24	63% (98)	86%
25-34	21% (134)	35%
35-44	4% (141)	19%
45+	0% (208)	13%

This table reveals a significant decline in the propensity to marry among women of all age groups in the period between 1593-1694 and 1851. There was no difference in the incidence of marriage in women acting as witnesses in different kinds of disputes. Of 66 women aged over thirty-five acting as witnesses in personal disputes in the period 1573-1616, all were either married or widowed, and this was also the case in the group of 54 women acting as witnesses in property cases.[114]

[113] Burchall (2014); 1851 Enumeration Census. The quality of the 1593-1694 data is high, with 95% of cases – 581 of 612 – with recorded information on the age and marital status of female deponents.

[114] These samples were derived from the first 220 female witnesses in the period 1573-1616, 132 of which dealt with personal and 88 with property disputes.

There is evidence from an alternative source which dealt with mainly property cases – the Chancery Exchequer Court depositions for the county of Norfolk – which can also be compared to 1851 Census data.

Table 33: Proportion of Single Women in Norfolk, 1649-1714 and in the Norfolk 1851 Census (Number of Cases in Brackets).[115]

Age Group	*Norfolk, 1649-1714*	*Norfolk, 1851 Census*
15-24	72% (43)	84%
25-34	34% (76)	32%
35-44	5% (75)	16%
45+	2% (173)	10%

Although the sample sizes are small in the 1649-1714 material, they indicate that except for the 25-34 age group, there were increasing numbers of single women in all age groups, largely confirming the pattern indicated by the Sussex data.

However, these findings are based on evidence from only two counties, and to see whether this is representative of England as a whole it is necessary to look elsewhere. Church Court depositions have been used recently by Shepard and Spicksley in their study of wealth distribution in early modern England, and their research covered a wide range of occupational groups and English counties.[116]

[115] For the source of this data see *Norfolk Chancery Deponents, 1649-1714*.
[116] The female deponents resided in 24 different English counties, although they were concentrated in the counties covered by the church courts.

Table 34: Proportion of Single Women in the Dioceses of Canterbury, Chester, Chichester, Ely, London, Salisbury, York, the Archdeaconries of Lewes and Richmond, and the Cambridge University Courts, 1550-1699(Number of Cases in Brackets).[117]

Period	*Age Group, Proportions Single*			
	15-24	*25-34*	*35-44*	*45+*
1550-1624	76% (258)	22% (371)	5% (313)	2% (461)
1625-1699	78% (344)	29% (363)	7% (311)	4% (447)
1851 (England & Wales)	83%	33%	16%	11%

There was an increase amongst all age groups in the proportion of single women in the period between 1550-1624 and 1625-1699. Also, a long-term comparison of the 'worth' evidence with national returns in 1851 indicates that the proportion of women ever marrying was higher in 1550-1699 amongst all age groups.

Shepard and Spicksley only selected cases where there was information on 'worth' – a third of all church courts deponents in the districts studied[118] – and although they attempted to create a nationally representative sample, they admitted that 'despite attempts to create a balanced sample, the subset we have compiled remains unevenly distributed over time and place.'[119] However,

[117] For the nature and characteristics of the study see Shepard and Spicksley (2011). Where there was no indication of marital status but a woman was designated as a servant, it was assumed that she was single. In the 'Worth' dataset there were 190 women described as servants with a marital status, of which 183 were listed as spinsters. The national figures for England & Wales are taken from the *1851 Enumeration Census*.
[118] See *Worth of Witnesses*.
[119] Shepard and Spicksley (2011), 512.

there is sufficient evidence in the 'worth' dataset to allow an analysis of nuptiality amongst women over the age of thirty-five for some counties, which can be compared to evidence from the 1851 Census.

Table 35: Proportion of Single Women Aged Over Thirty-Five in 1550-1699 and 1851. (Number of Cases from 'Worth' Dataset in Brackets).[120]

County	*Proportion Single in 1550-1699*	*Proportion Single in 1851*
Lancashire and Cheshire	4% (103)	13%
London	3% (218)	17%
Kent	4%(639)	14%
Sussex	4% (117)	15%
Wiltshire	4% (178)	13%
Yorkshire	5% (87)	11%

There is little difference in the proportion of single women in the different counties in the period 1550-1699, and there is a significant long-term increase – of the order of about 10% – by the mid-nineteenth century.

Most church court data is only available until the end of the seventeenth century, but that for the Consistory Court of London continues until the nineteenth century.

[120] For the worth dataset see *Worth of Witnesses*. The 1851 evidence is taken from the *1851 Enumeration Census.*

Table 36: Proportion of Female Deponents Single in the London Consistory Court, 1583-1817 (Total Number of Cases in Each Age Group in Brackets).[121]

Period	*Age Group – Proportion Single*			
	15-24	*25-34*	*35-44*	*45+*
1586-1611	62% (65)	15% (115)	1% (98)	0% (117)
1703-1713	72% (158)	25% (165)	7% (130)	4% (0)
1752-1783	77% (165)	43% (173)	14% (138)	5% (174)
1792-1817	76% (109)	53% (130)	13% (77)	15% (129)
London, 1851 Census	82%	36%	19%	17%

The evidence for the London Consistory Court indicates that there was a significant fall in the propensity to marry amongst all age groups in the eighteenth century. The similarity between the proportion of single women in the 45+ age group in 1792-1817 – 15% - and that in the 1851 census – 17% – suggests that the deposition sample was fairly representative of the general population at that time.

The almost universal tendency to marry in the period 1586-1600 is also suggested by evidence from the large London parish of St. Botolph Aldgate. The parish was on the edge of the city of London and contained mainly artisans, tradesmen and mariners.[122]

[121] The information for the early period, 1586-1611 is less reliable than for later periods. Only 65% of cases in the latter had full information on age and marital status, whereas there was complete evidence on 99% of cases in 1703-13, 1783-90 and 1805-16. The London Consistory Court figures for: 1586-1611 are all cases in Giese (1995); for 1703-13 they are based on all cases listed in Webb (1999); for 1752-83 they were from DL/C/273-281 in the London Metropolitan Archive and for 1792-1817 they are taken from DL/C/287-291, DL/C/641. The London figures for 1851 are taken from the *1851 Enumeration Census.*

[122] See the *St. Botolph Aldgate Parish Clerks' Memorandum Books.*

The burial register includes information on marital status and age at death, allowing an analysis of marriage patterns as follows:

Table 37: Proportion of Single Women in the St. Botolph Aldgate, London Burial Register,1579-1600.[123]

Age Group	*St. Botolph Aldgate*		
	Number Single	*Total Number in Age Group*	*Proportion Single*
15-24	90	111	80%
25-34	37	136	27%
35-44	8	109	7%
45+	10	306	3%

The proportion single in the groups above the age of thirty-five are similar in Tables 36 and 37 for the periods 1586-1611 and 1579-1600, confirming the very high incidence of marriage in late sixteenth century London. There are however slightly more women ever marrying in the younger age groups in the deposition sample than in St Botolph burial register. There is evidence that the marriage of women in London occurred at an earlier age than elsewhere in the seventeenth century.[124] For example the mean age of marriage of single women marrying in St. Dunstan & All Saints Stepney in 1653-66 during a period of civil registration was 22.5 years (N = 167), with 43% marrying under the age of twenty-one. There is other data to indicate early marriage in London: for example, 41% of single women who married by licence in 1660-61 were under the age of twenty-one.[125] It is probable that the

[123] The quality of evidence is high, with 662 out of 680 total burials – 97% - with full information on age and marital status. For the source of this data see Ibid.

[124] Elliott (1978).

[125] See the *St. Dunstan & All Saints Stepney Marriage Register* and the first 100 cases in the *Vicar-General's Marriage Allegations, 1660-68.*

deposition material is somewhat more representative of the general population than the burial register evidence.

There is also information on age and marital status of women in the Allhallows-in-the-Wall burial register for the period 1579-98, although the sample sizes are too small for a complete analysis of all age groups. There were 57 women buried over the age of 35, all of whom had been married or widowed[126] – 100% – again confirming the near universal propensity to marry in London at the end of the sixteenth century. The Stepney burial register also records information on age and marital status of women for the later period 1732-36 (89% with full information), and again indicating a very high incidence of marriage at this time.

Table 38: Proportion Women Single in St. Dunstan Stepney Burial Register, 1732-36.[127]

Age Group	*Proportion Single*	*Number in Sample*
15-24	52%	48
25-34	14%	92
35-44	8%	93
45+	2%	381

Evidence is also available on Yorkshire deponents for 1560-1857, allowing a detailed analysis for the whole period between the middle of the sixteenth and the nineteenth centuries.

[126] See the *Allhallows-in-the-Wall Burial Register*.

[127] The data for the earlier period is less reliable than the later ones, with the proportions of cases lacking full information on age and marital status as follows: 1600-05: 27%; 1660-65: 12%; 1700-08: 2%; 1750-57: 12%; 1800-05: 5%. See the *St. Dunstan Stepney Burial Register*.

Table 39: Proportion of Single Female Deponents in the Yorkshire Church Court, 1560-1857 (Number of Cases in Brackets).[128]

Period	*Age Group, Proportion Single*			
	15-24	*25-34*	*35-44*	*45+*
1560-99	78% (96)	27% (139)	3% (113)	0% (175)
1600-42	69% (83)	25% (122)	3% (122)	3% (147)
1660-99	87% (164)	41% (199)	8% (126)	4% (344)
1700-49	78% (113	42% (150)	11% (112)	4% (200)
1750-99	85% (67)	62% (63)	32% (59)	9% (118)
1800-57	86% (96)	43% (110)	28% (101)	13% (200)
Yorkshire, 1851 Census	81%	30%	14%	10%

The figures for the late eighteenth century are based on relatively small samples and the material for the nineteenth century suggests that this deposition sample was not totally representative of the whole Yorkshire population. However, the proportion of women ever married in the 45+ age group in 1800-57 – 87% – is very similar to that for Yorkshire according to the 1851 census – 90%, and the equivalent proportion in 1841-57 in the deposition sample – 89% (N = 78) – is nearly identical. The overall evidence in Table 38 supports the conclusion that there was a significant decline in the frequency of marriage in Yorkshire as elsewhere in England.[129]

Although not a random sample, the deposition records cover a wide range of socio-economic groups, as indicated by the Sussex depositions.

---

[128] See the *Cause Papers*.

[129] Data for the burial register of Ackworth, Yorkshire provides an element of confirmation for this conclusion. The proportion of women over the age of 45 who died as single women was as follows in the period 1744-88: 4% (N = 142); 1789-1812: 14% (N = 107). See the *Ackworth Burial Register*

Table 40: The Occupations and Literacy Levels of Male Deponents in Sussex in 1556-1694.[130]

Occupation	*Number of Deponents*	*Proportion Signing Depositions*
Gentlemen	393	99%
Yeomen	679	59%
Artisans, Tradesmen	537	45%
Husbandmen	171	14%
Labourers	5	0%

All occupational groups are represented in the depositions, including large numbers of husbandmen, who were one of the poorest socio-economic groups in England,[131] although labourers are under-represented in the sample.

There is no similar information on the occupations of female deponents, but given that there was a correlation between socio-economic status and literacy, the most effective way of measuring the status of female deponents is to analyse their literacy levels. In Sussex for the period 1556-1694, the proportion of wives who signed depositions according to husband's occupation was as follows: husbandmen: 2%; artisans & tradesmen: 8%; yeomen: 17%; gentlemen & professionals: 44%.[132]

Houston has carried out an analysis of female literacy in Northern England in the periods between 1640 and 1770, using mainly husband's occupation as a measure of socio-economic status.

[130] For the source of this data see Burchall (2014).
[131] Baxter (1926).
[132] The number of total cases in each of the Sussex samples is as follows: Husbandmen: 110; Artisans & Tradesmen: 107; Yeomen: 44; Gentlemen & Professional: 18.

Table 41: Proportion of Women Unable to Sign Legal Depositions in Northern England, 1640-1770. (Number of Cases in Brackets).[133]

Occupational Group	*1640-99*	*1700-70*
Professional & Gentry	24% (17)	0% (10)
Craft & Trade	78% (60)	69% (94)
Farmer/Tenant	88% (24)	68% (31)
Labourer	95% (20)	88% (24)
Servant	85% (39)	75% (51)

Although the sample sizes are small, there was a moderate association between occupation and literacy which became stronger over time, with the wives of professional/gentry and farmers/tenants showing the greatest improvement.

The association between status and female literacy is confirmed by a study of Yorkshire church court depositions. In 1770-1817, 56% of women married to husbands with manual occupations signed their depositions with a mark, compared to 17% of those married to men with non-manual occupations.[134] Data from the civil marriage register of St. George Bloomsbury, London indicates a similar pattern in the later period, 1838-42: of the first 50 marriages of professionals and gentlemen, all but 1 of the brides signed the register, whereas this was true of only 14 of the 50 wives of labourers.[135]

In Sussex, the overall proportion of female deponents signing depositions was as follows: 1580-99: 2%; 1600-40: 4%;

[133] Houston (1985), 60.

[134] There were 78 husbands with manual occupations, and 36 with non-manual occupations. 14 of 16 women married to labourers signed with a mark, as against 0 of 16 women married to gentlemen and professionals.

[135] See the *St. George Bloomsbury Marriage Register.*

1661-94: 15%.[136] Literacy levels amongst the general population have been summarized by Stephens as follows:

> 'Women were almost universally unable to sign their names in 1500, and by 1600 only some 10 per cent could do so, the proportion rising to 25 per cent by 1714 … in northern England … female literacy [rose] from 26 [in the 1720s] to 32 per cent [by the 1740s]. From 1754 the fuller marriage register evidence suggests that signature literacy rose from … some 40 [in 1754] to 50 per cent [in 1840].'[137]

The Sussex evidence is compatible with Stephens' conclusions about female levels of literacy, but more direct evidence is available for London, where literacy levels were higher than elsewhere.[138] The London Consistory Court records indicate that the proportion of women signing depositions rose from 41% to 59% between the middle and the end of the seventeenth century, and increasing further to 75% – 685 out of 916 – in the period 1786-1816.[139]

A study of the marriage registers of twelve London parishes indicates that the proportion of brides signing these registers was as follows: 1754-60: 67%; 1786-97: 65%; 1806-16:

[136] These figures are based on the first 100 cases in each period in Burchall (2014).

[137] Stephens (1990), 555. Chambers cited evidence for Lincolnshire which showed in one sample an increase of women signing marriage registers from 27.7% in 1764-69 to 54.2% in1810-19. Chambers in Glass and Eversley (1965), 326.

[138] In 1838/39, 23.9% of women marrying in the metropolis signed the registers with a mark, compared to 48.7% in England & Wales. See the *Registrar-General's Second Annual Report*, 13.

[139] For the seventeenth century figures see Earle (1994), 37; for the 1786-1816 period see DL/C/282-293 in the London Metropolitan Archive.

73%; 1830-51: 77%.[140] This latter proportion is nearly identical to the percentage of all London women signing marriage registers in 1838 – 76%[141] – indicating that the marriage register sample is representative of all London marriages. The average marriage register figure for 1786-1816 is 69%, lower than the 75% found in the deposition sample, suggesting that there were slightly more literate women in the deposition sample than in the general population.

It is possible that changes in literacy levels played a role in the reduction of female nuptiality. In London in 1786-1816, female deponents over the age of thirty-five who signed depositions with a signature were more likely to be single that those signing with a mark.

Table 42: Literacy and Single Status amongst Women Aged 35+ in London, 1786-1816.[142]

Women Aged 35+ Signing Depositions		*Women Aged 35+ Signing With A Mark*	
Number of Cases	*Proportion Single*	*Number of Cases*	*Proportion Single*
323	20%	91	5%

[140] The parishes are: Allhallows Bread Street, Allhallows Lombard Street, Allhallows London Wall, St. Alban Wood Street, St. Alphage Greenwich, St. Dunstan & All Saints Stepney, St. George Southwark, St. John Hackney, St. James Clerkenwell, St. Mary Islington, St. Matthew Bethnal Green, St. Saviour Southwark. 600 cases were selected for each time period, the first 50 cases in each parish register were selected for the years 1754 and 1786, the last 50 cases counting backwards for 1816, and the first 50 cases from 1830 onwards.

[141] *Registrar-General's Second Annual Report,* 13.

[142] See DL/C/282-293 in the London Metropolitan Archive.

There was an association between socio-economic status and female literacy levels in London in the mid-nineteenth century, as revealed by Registrar-General's returns for the Western and Eastern districts of London.[143]

Table 43: Socio-Economic Status and Women Marking Marriage Registers in London Registration Sub-Districts in the Mid-Nineteenth Century.

Registration Sub-District	*Socio-Economic Status Rating (Glass) in 1851*	*Proportion Signing Marriage Register With A Mark in 1841*
Hanover Square	215	6%
St. James Westminster	182	6%
St. Martin-in-the-Fields	160	7%
Shoreditch	80	39%
Bethnal Green	60	40%
Stepney	57	40%
St. George-in-the-East	46	28%
Whitechapel	44	31%
Poplar	41	24%

Although there was no linear link between the status of a district and its literacy level, the wealthier sub-districts in the West End of London – Hanover Square, St. James Westminster and St, Martin-in-the-Fields – had significantly lower proportions of women marking marriage registers than the East End districts. The following table summarizes the nuptiality profiles of the sub-registration districts in order of their socio-economic ranking.

[143] For the rankings of relative socio-economic status – average 100 – see Glass (1938), and for the data on literacy see the *Registrar-General's Fifth Annual Report*.

Table 44: Female Marriage Patterns in Sub-Registration Districts of London in 1861.[144]

Registration Sub-District	*Age Group – Proportion Ever Married*				
	15-19	*20-24*	*25-34*	*35-44*	*45+*
Hanover Square	2%	17%	46%	67%	77%
St. James Westminster	3%	21%	54%	76%	82%
St. Martin-in-the-Fields	4%	25%	60%	79%	84%
Shoreditch	5%	45%	77%	88%	88%
Bethnal Green	5%	47%	82%	92%	91%
Stepney	5%	45%	80%	92%	94%
St. George-in-the-East	6%	45%	80%	91%	93%
Whitechapel	5%	39%	77%	89%	90%
Poplar	5%	45%	86%	93%	93%

There were marked differences in nuptiality levels in the two types of district, with marriage occurring much more frequently at all ages in the East End than the West End of London. This was probably a function of relative poverty, levels of literacy and the number of servants.[145]

A more focused analysis is possible by examining the enumeration schedules of four wealthy and four poor areas in London recorded in the 1851 census.

[144] *Enumeration Census 1861*, 10.

[145] See Glass (1938) for an analysis of the socio-economic profiles of London districts in the mid-nineteenth century.

Table 45: Female Marriage Patterns in London Areas in 1851 (Number of Cases in Brackets).[146]

Age Group	*Four Wealthy Areas*	*Four Poor Areas*	*Four Wealthy Areas Minus Servants*
	Proportion Ever Married	Proportion Ever Married	Proportion Ever Married
15-24	8% (424)	37% (355)	16% (200)
25-34	42% (332)	87% (352)	58% (208)
35-44	69% (241)	95% (286)	82% (173)
45+	79% (238)	97% (356)	87% (183)

There were strong differences in the propensity to marry between the two types of district, with women marrying much more frequently and at an earlier age in the poor than in the wealthy areas. This was partly a function of the large number of domestic servants in the former than in the latter, with 38% – 478 out of a total of 1247 women – of servants in the wealthy areas, compared to 1% – 8 of 1355 – in the poor districts. However, the analysis of non-servant women living in the wealthy areas again indicates significantly fewer women marrying in those areas.[147]

[146] For the source of this data see the *Enumeration Census 1851*. The four wealthy districts are Allhallows Bread Street, Allhallows Lombard Street, St. Alban Wood Street and St. James Square, St. James Westminster Enumeration Districts 2 and 3. The poor districts are: St. Dunstan Stepney Ratcliff Enumeration District 5, Bethnal Green Hackney Road Enumeration Districts 1 and 5, Southwark Borough Road Enumeration District 1, Greenwich West Enumeration District 6. The areas were partly chosen on the basis of the estimated economic status of the registration districts of which they are a part – see Glass (1938) – but also on the number of families with domestic servants.

[147] Tables 44 and 45 do not allow for the effect of migration, particularly young women becoming servants outside their parish of birth. However, the 1851 Census allows for the tracking of emigrants, and a pilot study of 100

Given that fertility was largely shaped by nuptiality in this period, this finding is supported by research carried out by Glass on the socio-economic status and fertility rates of the thirty-three registration districts in London in the middle of the nineteenth century. Using 1851 census and civil registration returns, he found a strong negative correlation between the status of a district and its gross reproduction rate for the period 1849-51.[148] Glass used four criteria for classifying the economic status of a district:

1. The number of males engaged in professional occupations per 100 occupied males.
2. The number of occupied males per 100 males employed in occupations indicative of low status areas.
3. The number of female domestic servants per 100 total population excluding domestic servants.
4. The percentage of the total population living less than two a room.[149]

---

women – 50 aged 25 and 50 aged 34 – born in Bethnal Green, suggests that migration did not significantly affect findings on poverty and nuptialty. 61 of these 100 women continued to reside in Bethnal Green, 5 were domestic servants, and 73 were married or widowed. The proportion ever married – 73% – is lower than the proportion of women aged 25-34 ever married in the 4 poor parishes in Table 40 – 87% – but significantly higher than the 58% amongst non-servant women living in wealthy areas.

[148] Glass (1938), 118.

[149] Ibid.

Table 46: Relation between Fertility and the Socio-Economic Status Rankings of London Registration Districts, 1849-51.[150]

Registration District	*Gross Reproduction Rate*	*Socio Economic Status*
Hanover Square	1.035	215
St. James Westminster	1.094	182
Hampstead	1.065	178
Kensington	1.339	164
St. Martin-in-the-Fields	1.410	160
Strand	1.470	152
Pancras	1.632	139
Marylebone	1.371	139
Islington	1.583	130
Hackney	1.583	130
Camberwell	1.618	126
Wandsworth	1.667	119
St. Giles	1.646	119
Holborn	1.670	113
Lewisham	1.639	110
Chelsea	1.688	105
Clerkenwell	1.969	104
Lambeth	1.838	102
Newington	2.078	87
Shoreditch	2.212	80
Westminster	1.809	74
St. Luke	2.361	69
St. Saviour Southwark	1.951	66

[150] Ibid, 118.

Greenwich	1.841	66
St. George Southwark	1.960	64
Bethnal Green	2.432	60
Stepney	1.953	57
Bermondsey	2.367	57
St. Olave Southwark	1.656	49
St.George in the East	2.247	46
Whitechapel	1.972	44
Poplar	2.475	41
Rotherhithe	2.267	37
London	1.762	100

Glass recognized that the presence of domestic servants affected the association between a district and its fertility rate, so he excluded very wealthy areas with known high numbers of servants for a revised analysis, which also found a very high negative correlation between economic status and gross reproduction rates.[151]

There was a similar association between socio-economic status and marriage/fertility in areas outside of London. The sample of four parishes known for their wealth and status, matched with four poor parishes in the same county, were used for analysing nuptiality levels. The socio-economic characteristics of the parishes are as follows:

[151] Ibid, 119, 120.

Table 47: Socio-Economic Characteristics of Eight English Parishes, 1851 English Census.[152]

Parishes	*Proportion of Female Servants*	*Proportion of Male Labourers*	*Proportion of Male Professionals*
Bath, St. Michael	29%	4%	4%
Cheltenham	29%	13%	5%
Richmond	27%	6%	4%
Brighton	25%	13%	3%
Hambledon	14%	55%	2%
Hailsham	14%	44%	1%
Westbury	13%	51%	2%
Clutton	7%	17%[153]	1%

The following Table summarizes the frequency of marriage in the eight districts arranged in the order of their relative social-economic status. Given the influence of domestic servants – many of whom were single – data is also presented for all women minus the number of servants.

[152] The data in this table was selected from *ICEM Data*. The number of domestic servants was used as the initial criteria for selecting parishes.
[153] The proportion of labourers in this parish is low because of the presence of a large number of miners and others working in the mining industry.

Table 48: Proportion of Single Women by Age Group in Eight Parishes, 1851. (Number of Women in Brackets).[154]

	All Women Minus Servants			
Parish	*Age Group – Proportion of Single Women*			
	16-25	26-35	36-45	45+
Bath	83% (265)	38% (216)	19% (209)	17% (253)
Cheltenham	74% (1760)	32% (2345)	19% (2224)	17% (3702)
Brighton	82% (5092)	26% (4842)	17% (3869)	14% (5972)
Richmond	79% (661)	27% (622)	20% (485)	21% (882)
Hambledon	77% (156)	22% (125)	13% (119)	13% (209)
Hailsham	64% (102)	16% (114)	9% (100)	13% (150)
Westbury	65% (131)	46% (61)	5% (108)	7% (231)
Clutton	65% (63)	18% (107)	4% (68)	0% (47)

There were significant differences in nuptiality in the different types of parish, with women marrying much more frequently at all ages in the four poorer areas. These marriage patterns are reflected in the fertility levels of the registration districts of which the parishes were a part.

[154] *ICEM Data*.

Table 49: Numbers of Births per 100 Women Aged 15-44 in Eight Registration Districts, 1860-62.[155]

Registration District	*Proportion of Female Domestic Servants*	*Proportion of Male Labourers*	*Births per 100 Women Aged 15-44*
Richmond	25%	10%	9.4
Bath	22%	14%	8.6
Cheltenham	21%	17%	9.2
Brighton	19%	9%	11.1
Hambledon	11%	57%	16.0
Hailsham	9%	45%	16.7
Westbury	7%	26%	17.1
Clutton	6%	27%	17.4

The poorer districts had fertility rates significantly higher than the wealthier ones – with a more-or-less linear gradient depending on socio-economic status – similar to the findings in London.

The above links between status and nuptiality/fertility are based on ecological evidence, which do not allow for more detailed analysis of individual variations. However, such evidence is available for the county of Bedfordshire for the whole period 1538-1851. The Bedfordshire Family History Society has transcribed and digitised all baptisms in the county, both for the 124 Anglican parishes and the dissenting congregations with surviving records.[156] However, the data should be treated with a degree of

[155] For the data on births see the *Registrar-General's Twenty Third, Twenty-Fourth and Twenty-Fifth Annual Reports;* for the number of women living the *Enumeration Census , 1861*. The figure of births for Richmond is based on the two years 1860 and 1862, as the return for 1861 was inflated by hospital admissions.

[156] A CD of all baptisms, marriages and burials for the period 1538-1851 has been kindly provided by the Bedfordshire Family History Society.

caution, as the number of baptisms in 1849-51 was only 71% of the number of births in the same period.[157] An analysis of occupational fertility rates, expressed as percentage of baptisms per 100 men living in the age group 20-50, reveals the following pattern.

Table 50: Bedfordshire Baptism Fertility Rates, 1849-51.[158]

Occupational Group	*Number of Baptisms 1849-51*	*Number of Men Living Aged 20-50 in 1851*	*Annual Fertility Rate per 100 Men Living*
Farmers	294	1148	8.5
Labourers	5280	10887	16.2
All Other Occupations	3008	11120	9.0
All Occupations	8582	23155	12.4

The number of farmers was relatively small compared to the number of labourers, but there was a sharp difference in their fertility rates. This partly accounts for the large number of baptisms to labourer fathers – about two-thirds of the total – although according to the census they formed under half of the total population.

It is possible to trace marriage patterns amongst landed families in Hertfordshire and Northamptonshire for the three hundred year period 1550-1849. Genealogies were compiled using a large number of sources: parish registers, wills, monumental inscriptions, visitations, inquisitions and other forms of evidence. Although the focus of these genealogies was on landed families,

[157] The number of baptisms was 9,889 and births 14,003. For the data on births see the *Registrar-General Twelfth, Thirteenth and Fourteenth Annual Reports.*

[158] The number of men living aged 20-50 is taken from the *Enumeration Census 1851*.

often their daughters married into mercantile, trading and other middle class families, particularly in the earlier period. The proportion of women who were single at the age of thirty-five was as follows:

Table 51: Women from Landed Families in Hertfordshire and Northamptonshire: Proportion Who Were Single at the Age of 35, 1550-1849.[159]

Period Of Birth	*Number of Cases*	*Proportion Single at Age 35*
1550-99	68	12%
1600-49	94	13%
1650-99	94	31%
1700-49	103	39%
1750-99	100	42%
1800-49	153	26%

It is probable that some women may have married after the age of thirty-five, diminishing the proportion of single women. However, Table 51 indicates that there were a minimal number of single women in the period 1550-1649, but a very sharp rise after the middle of the seventeenth century. Although the numbers of single women were much higher amongst these landed families than in the deposition and other samples discussed earlier, the pattern is very similar in all datasets: nearly a universal propensity to marry

[159] Source Warrand (1907); Barron (1906). Only women who were in observation until the age of thirty-five were included in the analysis. This could be through death, mention in a will or in one of the other sources used in the study. Of 953 women listed in the genealogical volumes, 612 were in the 35+ category. Most of the 341 cases not included in the analysis were the result of truncated periods of observation or imperfect information in the genealogies. For a similar pattern of nuptiality amongst the aristocracy see Hollingsworth (1965), 17.

in women until the middle of the seventeenth century, and then an increase in single status after this date.

We have already seen that in Sussex during the seventeenth century only a minority of the wives of gentlemen and yeomen were able to sign depositions. Evidence from the analysis of London wills indicates that wealthy women in these districts were unable to sign their names in the early period, but that this changed significantly during the eighteenth century.

Table 52: Proportion of Women Signing London Wills, 1599-1851.[160]

Period	*Proportion Signing Wills*	*Number of Cases*
1599-1601	2%	100
1639-41	15%	100
1699-1701	38%	100
1749-51	64%	100
1799-1801	77%	100
1849-51	86%	100

Most of these wills in the early period were made by widows, although their numbers reduced during the eighteenth and early nineteenth centuries. In 1700-01, according to a small sample of cases, 84% of London wills were made by widows, whereas by 1849-51 this proportion had fallen to 45%.[161] Widows were probably aged about 65 years on average,[162] and as most wills were

[160] These figures are based on the first available 100 women leaving wills selected alphabetically in the periods in question. See *London Wills and Probates, 1507-1858*.

[161] The first 100 cases of women leaving wills in 1700-01 and 1849-51 were selected from *London Wills and Probates, 1507-1858*.

[162] The age at burial of widows dying in St. Botolph Aldgate in 1583-95 was 63 years (N = 188) and that in St. Dunstan Stepney in 1732-36 was 64 years (N = 242).

left by widows in the eighteenth century, this suggests that increases in literacy women in Table 52 occurred mainly from the middle of the seventeenth century onwards, similar to the chronology of the changes in marriage patterns. There is very little data on the wealth of widows but research on 50 inventories for the late seventeenth century indicates that they were moderately wealthy at that time.[163] A sample of 100 cases indicates that women in London left an average of £519 in wills in 1849-51,[164] a reasonably large sum for the period.

The proportion of spinsters leaving wills in England & Wales increased significantly between the middle of the seventeenth and nineteenth centuries. In 1658 during a period of civil registration, 12% of wills were made by single women, a proportion that had increased to 35% by 1860.[165] There was an even greater increase in London: from 13% in 1700-01 to 41% in 1849-51.[166] These figures provide further evidence of increasing numbers of single women in this period.

The general relationship between status and fertility was widely recognised by contemporaries in the nineteenth century:

> 'In England most of the writers who took part in the Malthusian controversy in the early part of the nineteenth century were fully aware of the existence of a negative relationship between fertility and socio-economic status. It was

[163] Earle (1991), 109.

[164] The sample was taken from the first 100 cases in *London Wills and Probates, 1507-1858*.

[165] The 1658 figure is based on the first 100 cases in Brigg (1894); the 1860 one from the first 100 cases in the *National Probate Calendar*. The mean value of the personal estate left by 35 spinsters in 1860 was £885, compared to £968 left by 53 widows.

[166] The 1700-01 and 1849-51figures are based on the first 100 cases in each period in *London Wills and Probates, 1507-1858*. The mean value of the estates of spinsters in 1849-51 was £630 (N = 41), and for widows it was £460 (N = 45).

> referred to by Malthus himself, by William Godwin, John Stuart Mill, Harriet Martineau, and Nassau Senior, to mention only a few of the better known intellectual figures of the day …'[167]

Malthus wrote that 'it is not … among the higher ranks of society, that we have most reason to apprehend the too great frequency of marriage … [it is] squalid poverty … which is a state the most unfavourable to chastity…'[168]

More recently Szreter and Garrett have concluded that the inverse relationship between nuptiality and socio-economic status emerged first in the middle of the eighteenth century:

> 'Why was it that, from the mid-eighteenth century onward in the economically fastest-growing and most prosperous society in the world, the most privileged strata, rather than their less fortunate countryman, became increasingly conscious of the need to defer marriage?'[169]

Szreter and Garrett were mainly interested in the impact of economic circumstances on male nuptiality patterns, but the focus of the present book is on the frequency of female marriage.

There is the possibility that church courts disproportionately selected married women as witnesses because of their greater social standing, particularly in courts dealing with domestic matters. However, the evidence on deponents in Sussex and the Norfolk chancery court in Table 33 dealing mainly with property disputes, also indicates that marriage was virtually universal amongst non-domestic deponents in the sixteenth century.

---

[167] Wrong (1958), 78.
[168] Malthus (1992), volume 2, 114, 150.
[169] Szreter and Garrett (2000), 67.

More importantly, if married women were chosen disproportionately, the evidence from the 'worth' study and the analysis of the London and Yorkshire church court records would be subject to this bias across the whole of the seventeenth and eighteenth centuries – like for like – and yet the evidence from these studies shows that there was a consistent and significant reduction in the propensity to marry over the period. Additionally, the evidence for the nineteenth century suggests that the deposition data for the 45+ age group for London and Yorkshire was representative of their 1851 census populations, and the material presented in this book – from the censuses for the three parishes covered by Tables 29, the burial registers of the Bedfordshire parishes, St. Botolph Aldgate, Allhallows-in-the-Wall and St. Dunstan Stepney, and the data on landed families and national wills – provide independent evidence that marriage was nearly universal before the eighteenth century.

Tables 29-39 indicate that there was a very high propensity to marry amongst women in the late sixteenth and the whole of the seventeenth century. This might explain why the population expanded so rapidly in the first half of the seventeenth century, in spite of very high adult mortality.

The reasons for the decline in the incidence of marriage are likely to involve a number of factors. For example, the death of men in the English civil war reduced the number of marriage partners for women after the middle of the seventeenth century.[170] For the eighteenth century, the decline in adult mortality probably had an impact on the incidence of marriage and the remarriage of widows, and may have also influenced the frequency of female marriage through a decline in the number of widowers available for

[170] Carlton has estimated that about 190,000 extra people were killed as a result of the civil war out of a total population of about five million. As most of these extra deaths would have been of adult men, this suggests that well over ten per cent of men were killed as a result of the war. See Carlton (1995), 212-14, 386.

marriage.[171] Malthus concluded that falling mortality had led to a reduction in the incidence of marriage:

> '… the gradual diminution and almost total extinction of the plagues which so frequently visited Europe, in the seventeenth and the beginning of the eighteenth centuries, produced a change [in the incidence of marriage] … in this country it is not to be doubted that the proportion of marriages has become smaller since the improvement of our towns, the less frequent return of epidemics, and the adoption of habits of greater cleanliness.'[172]

There is also strong evidence that increasing literacy played a major role in the reduction in the incidence of marriage, particularly amongst wealthier women. This does not seem to have been the case amongst very poor women, such as those covered by Table 45. The propensity to marry was very high in these poor parishes, but literacy levels also appear to have been high, with 61% signing the marriage registers in the period 1754-1838.[173]

---

[171] During the late seventeenth century about 26 % of spinsters in East Kent married widowers, and on average they married 3.8 years later than spinsters marrying bachelors. By the beginning of the nineteenth century, the proportion of spinsters marrying widowers had fallen to 11 %, probably reflecting the diminished number of widowers available for marriage due to a reduction in adult mortality. It is possible that many spinsters who had married widowers in the early eighteenth century were unable to find marriage partners in the later part of the century, leading in some areas to a fall in the mean age of marriage but a rise in the number of women never married. Razzell (2007), 131.

[172] Malthus (1992), 326. This is an example of the contradictory nature of Malthus's work, with his theoretical emphasis on the primary causal role of marriage, and his empirical work on England, which placed the stress on the influence of mortality.

[173] The marriage registers in question are for St. Dunstan Stepney, St. Matthew Bethnal Green, St. George Southwark and St. Alphage

Literacy may have been a necessary condition for the growth of single marital status for women but it was not sufficient. The lack of economic independence would have made it difficult for poor women to sustain a single marital status.

The above discussion on nuptiality suggests that the propensity to marry among women was nearly universal in the sixteenth and seventeenth centuries, but diminished significantly during the eighteenth century. Given that fertility was largely shaped by nuptiality in the early modern period, the evidence reviewed in this book suggests that there were falls in fertility in the eighteenth century, and that population growth in England was the result of reductions in infant, child and adult mortality.[174]

Greenwich. See the marriage registers in *Ancestry Online.* The first 50 cases were selected from each marriage register in the periods in question, with 800 cases in the total sample. The proportion of women signing the marriage register with a mark was as follows: 1754-55: 46% (N=200); 1786: 44% (N = 200); 1816: 36% (N = 200); 1838: 32% (N =200).

[174] See Benedictow (2012), 36.

Chapter 5: Explaining Changes in Mortality.

The factors responsible for mortality levels are complex. For example, smallpox became much more virulent between the sixteenth and nineteenth century: case fatality rates amongst unprotected children in London rose from about 5% to 45% in this three hundred year period. It is possible that the increasing fatality of smallpox was the result of the importation of more virulent strains with the growth of world trade. It was only the practice of inoculation and vaccination that prevented the disease from destroying a large part of the population.[175] Smallpox also varied in its age incidence between different areas of the country: in the South of England it was a disease of both adults and children, whereas in the North and elsewhere it affected mainly young children. This is important as case-fatality rates differed markedly between different age groups.[176]

To some extent, disease had its own internal logic, so that for example the disappearance of the plague in England in the 1660s does not appear to be the result of any environmental or other improvements. However, it is known that environmental factors did influence the incidence of disease. Mortality was higher in marshland areas, in industrial and urban districts, in certain coastal and estuarine regions, and lower in isolated rural areas with the right geographical and ecological characteristics.[177] The data presented in this book does not deal with these issues, and any conclusions reached from its evidence must necessarily be provisional.

It is possible that the lower levels of infant mortality amongst the wealthier socio-economic groups in Tables 13-15 are partly a function of wealth, although falling elite mortality in the second half of the eighteenth century suggests that non-economic

[175] Razzell (2003).
[176] Ibid, xiv-xix.
[177] Dobson (1997), Razzell (2007), 98, 99.

factors were at work.[178] The rapid fall in child mortality in elite families in the eighteenth century, at a time when it was stable amongst the control population, indicates that this reduction of mortality was exogenous to economic development. Also, the negative association between socio-economic status and child mortality in the mid-nineteenth century depicted in Tables 17 and 18 suggests that disease environment rather than poverty was the most important factor in shaping the level of mortality.

The explanations of these trends are complex: the wealthy are known to have fled London and other towns during the plague, to have escaped childhood diseases such as smallpox by moving away from areas known to be affected by the disease, and to have avoided marsh areas known to suffer from endemic malaria.[179] It is possible that by the mid-nineteenth century the avoidance of disease was no longer important in protecting wealthy groups from infection, particularly when they lived in urban areas.

Given that the reduction in adult mortality probably occurred more-or-less equally amongst all areas of the country and in all socio-economic groups, this suggests that there was an 'autonomous' fall in the adult death rate from the early eighteenth century. Although there is no consensus on real incomes, there appears to have been no significant rise in income levels in the

[178] Also, the level of infant mortality in Bedfordshire was higher amongst the elite than the control population in 1700-49. See Razzell (2007), 133.

[179] For evidence of avoidance of the plague by the rich, see Porter (2009), 77. The wealthy not only went to great lengths to avoid smallpox directly, but also frequently only hired servants who had previously had smallpox or had been inoculated or vaccinated. See Razzell (2003). Jane Austen wrote in *Sense and Sensibility* of the avoidance of infection at the end of the eighteenth century: "the word infection … gave instant alarm to Mrs Palmer on her baby's account … and confirming Charlotte's fears and caution, urged the necessity of her immediate removal with her infant." Austen (1994), 186. For the avoidance of unhealthy marsh areas, see Dobson (1997), 296-300. For a general discussion of avoidance of disease see Riley (1987).

eighteenth century.[180] This is consistent with the Cambridge Group's conclusion that, in the parish register period, 'mortality changes were not closely linked to economic factors such as changes in real incomes per head.[181] There is evidence that there was no one-to-one relationship between income and nutritional health and mortality. The nutritionists Clarkson and Crawford in their study of the history of nutrition in Ireland concluded:

> 'The potato period presents a paradox. To an economist, this was a time when the poor traded down to an inferior good. Not so the nutritionist. Potatoes and milk were excellent fare. There was a paean of praise for potatoes from contemporary observers, and only an occasional discordant note. Nutritional studies support the optimistic judgements and the population boom in the century before the Famine confirms the most cheerful of opinions. Post-famine Ireland offers an example of economic well-being and healthy diets moving in different directions. Living standards were rising, but the poorer people were not, in nutritional terms, better off. They ate wheaten bread, they drank stewed tea made syrup-like with sugar, and their 'desire for bacon', the fatter the better, had 'become almost an instinct'. They disdained whole milk in favour of thin, watery stuff left over from the creameries.'[182]

In spite of the increasing pauperisation of the Irish population in the pre-famine period, they were on average taller than the English

[180] There is still no overall consensus on economic development and changing real incomes in the eighteenth century. See Crafts (1989), Morsa (1989), Lucassen (1989), Woodward (1994); Feinstein (1998); Boulton (2000); Clark (2007), Allen (2007), Cinnirellan (2008), Humphries (2013).
[181] Wrigley, Davies, Oeppen and Schofield (1997), 552.
[182] Clarkson and Crawford (2001), 248.

and experienced lower mortality levels.[183] The data reviewed in this book about the relationship between socio-economic status and mortality further supports this conclusion that per-capita income was not a major determinant of health and mortality. The evidence indicates that the reduction in adult mortality was not linked to wealth/poverty or changes in per capita incomes, confirming Chambers' main thesis about the role of exogenous factors in mortality decline and population growth.[184]

The falls in infant mortality in rural and provincial parishes from the middle of the eighteenth century may have been in part due to an autonomous reduction in disease incidence, as well as the result of a variety of health improvements. These included better breastfeeding practices, inoculation/ vaccination against smallpox, and improved personal and domestic hygiene,[185] linked to growing literacy amongst women. There is good evidence that personal hygiene may have played a significant role in improving health and reducing mortality during the late eighteenth and early nineteenth century.[186]

The dramatic reduction of infant mortality in London was also probably a result of major improvements in public health –

---

[183] Mokyr and O'Grada (1989), 83-92; O'Grada, (1994), 18-22, 83-5, 104-10; Clarkson and Crawford (2001), 240; Razzell (1967), 268.

[184] The diseases involved in the reduction of mortality are unknown, but the disappearance of the plague in the seventeenth century is an example of a change in disease incidence exogenous to economic development.

[185] Jones and Falkus (1990); Porter (1991); Razzell (1994), 224-229; Razzell (2003).

[186] Herberden (1801); Haines and Shlomowitz, (1998); Guha, (1993). During the period 1801-41 per capita consumption of soap nearly doubled: from 5.3 pounds in 1801 to 9.9 pounds in 1841. Mitchell and Deane (1971), 8, 265. Cultural factors were very important: in the late nineteenth century, Jewish infant mortality was lower in very poor districts largely as a result of very high standards of personal and domestic hygiene. Marks and Worboys (1997), 187. For a detailed discussion of the impact of improved sanitation and hygiene on childhood mortality from diarrhoea see Burger and Esrey (1995).

increased water supplies, better drainage, and rebuilding of the urban landscape[187] – as well as much better maternal and neo-natal care.[188] The Lying-In Charity in London was founded in 1757 and delivered at home up to a third of all children born in the city.[189] Lettsom wrote in 1774: 'Within the space of a few years many lying-in hospitals have been established; in the lying-in charity alone nearly 5,000 women are delivered annually in their own houses, by persons well instructed …whereby not only many infants but likewise many women are saved',[190] a conclusion borne out by the surviving records of the charity.[191]

Although most of these measures were not the result of economic developments, clearly economic change did have an indirect influence on mortality. Agricultural improvements led to the drainage of marshland which may have contributed to the elimination of malaria,[192] and the production of cheap cotton cloth enabled working class families to improve their standard of personal hygiene. There was also an economic element in some of the other factors responsible for mortality decline: for example the rebuilding of houses and house floors in brick and stone. The increasing use of coal enabled water to be boiled more easily, important for personal and domestic hygiene.[193] However, elite social groups had always had the economic resources necessary for these improvements, and the majority of them probably resulted from new attitudes towards disease, personal hygiene and the

[187] George (1966); Jones and Falkus (1990); Porter (1991).
[188] George (1966), 61; Loudon (1992); Loudon (2000), 61.
[189] George (1966), 326.
[190] Lettsom (1774), 187.
[191] See the records of the Lying-In Charity in the Royal College of Obstetricians and Gynaecologists Library.
[192] Dobson (1997).
[193] I would like to thank Tony Wrigley for pointing out the potential importance of coal in boiling water for improving personal hygiene. For the use of boiling water and milk in preventing infant diseases see Marks and Worboys (1997), 192.

environment.[194] These changes in attitude and belief appear to have first influenced the educated and wealthy, and gradually spread to the general population later in the eighteenth and nineteenth centuries.

These improvements in personal and domestic hygiene took place amongst all classes of the community, as described by Francis Place in 1822:

> 'the change … has taken place, not only in London, but all over the country, in the habits of the working classes, who are infinitely more moral, more sober, more cleanly in their persons and their dwellings, than they were formerly, particularly the women; partly from the success of the cotton manufactures, which has enabled them to discard the woollen clothes which were universally worn by them, which lasted years, and were seldom, if ever washed; partly from increased knowledge of domestic concerns, and the nursing and general management of children. Notwithstanding the vice, the misery and disease which still abounds in London, its general prevalence has been greatly diminished.'[195]

The spread of improved personal and domestic hygiene might partly explain why there little or no difference in mortality rates between different socio-economic groups in London in the nineteenth century.

The reduction in adult mortality took place at a much earlier period than covered by the above improvements – from the early eighteenth century onwards – and there is evidence that these

[194] This shift in attitudes was partly associated with the eighteenth century enlightenment movement. The Royal Society's statistical investigation in the 1720s into the effectiveness of inoculation – comparing natural smallpox mortality with that amongst the inoculated – is perhaps the first historical example of a scientific assessment of a medical treatment. Razzell (2003), 172-74.

[195] Place, (1994), 253. See also Heberden (1801).

were largely the result of an ‘autonomous’ fall in mortality, exogenous to economic, cultural and medical developments.

Chapter 6: Population Growth and the Development of Capitalism.

The impact of population growth occurred within a particular English political, social and economic context, as noted by Chambers:

> 'it should be remembered that it performed this role in the especially favourable conditions that obtained there: an island economy, free from destructive wars, with a relatively equitable tax structure which placed the burden where it could best be borne, an innovating class that was prepared to make use of these advantages; and perhaps especially an agriculture with an inbuilt propensity for making the best use of the soil through the landlord-tenant system of cultivation.'[196]

The importance of this institutional context has been described by the medieval historian, Jane Whittle, in her discussion of the impact of exogenous population growth on the development of rural capitalism. She noted that population change had a different impact in England to that in Continental countries, depending on institutional variations:

> 'The severe reduction of population levels in England following the Black Death led to the dissolution of serfdom, a similarly severe reduction of population in seventeenth century Bohemia, the result of the Thirty Years War, led to the intensification of serfdom … in late medieval England, lords proved unable to enforce serfdom, and the institution collapsed…Serfdom also disappeared from France and western Germany, but led to different trends …The most obvious causes of difference, and lack of prosperity [in France], were the wars conducted on French soil from the fourteenth to the

[196] Chambers (1972), 18, 20.

> sixteenth centuries, and the heavy royal taxation to which French peasants were subjected from the late fifteenth century onwards … That English peasants were not subjected to a similar level of taxation was not a matter of chance. There were rebellions against taxation in 1489, and 1497 and 1525, as well as 1381... Yet because of the low level of taxation, English governments could not afford to keep a standing army to put down these rebellions.'[197]

Although Whittle is critical of unilateral demographic explanations of economic development, she accepts that population growth did have a major impact on economic and social change when economies were dominated by market relationships:

> 'Fluctuations in population levels have been used to explain some of the most important trends in medieval and early modern history, trends with vital importance to the development of capitalism … Manorial lords had retained their hold on the economy in the century before the Black Death because of the high demand for land. Once this factor was removed by population decline, the diversified economy undermined the manorial lord's position … Peasants, or rather wealthy peasants, had capitalized on the fifteenth century situation, building up their land holdings, and orientating themselves increasingly towards market production … Additionally … there was no shortage of labour in the sixteenth century [for the growth of capitalism]…'[198]

However, this account does not explain the English government's inability to impose high levels of taxation, along with its failure to form a standing army. Pellicani in his discussion of the history of

[197] Whittle (2000), 18, 19, 311. See also Brenner (1976).
[198] Whittle (2000), 18, 310.

capitalism, has emphasized the importance of political and military constraints on personal freedom:

> 'The *consumer's freedom* is as essential for the functioning of capitalism as the *entrepreneur's freedom* … The emancipation of the urban communities marks the beginning of the genesis of modern capitalism. Its roots are political and military, not economic. Cities were able to inject dynamism and rationality into the stagnant rural world only to the extent to which they succeeded in withdrawing from the effective jurisdiction of their lords and the spiritual control of economic obscurantism centred around the condemnation of profit and trade. They were successful precisely because they were opposed by a crumbling public power, lacking as never before the military and financial means to compel its subjects to obedience.'[199]

England's geographical position as an island on the edge of Europe and the Atlantic, meant that it was relatively free from the wars occurring on the continent, resulting in periodic recruitment of militias rather than the establishment of a permanent standing army.[200] The consequence of this was that the crown, as well as the aristocracy, was dependent on the population at large for the creation of military force.[201] The absence of a standing army made it difficult for the government to impose taxes and establish trade monopolies, important in the seventeenth century civil war, and eventually resulting in the development of markets relatively free of political and military control. England relied primarily on its navy for defence – which included its merchant fleet – and this partly explains its active involvement in world trade, an important dimension in the growth of English capitalism.[202]

---

[199] Pellicani (1994), 10, 123.
[200] Anderson (1974), 122-25.
[201] Barnett (1970), xvii-xx, 3-37.
[202] Ibid.

There were also important internal geographical factors associated with the development of capitalism in England.

> '… [there was] a growing distinction between working communities in forest and in fielden areas. In the nucleated villages characteristic of the latter … manorial customs [were] fairly rigid, political habits comparatively orderly, and the labourer's outlook deeply imbued with the prevalent preconceptions of church and manor-house. In these fielden areas labourers often … more or less freely [accepted] their dependence on squire and parson. Few of them were really well-off, their holdings were usually small, and their common rights negligible; but the very poor were less numerous than in woodland settlements … In the isolated hamlets characteristic of forest settlements … the customs of the manor were sometimes vague or difficult to enforce, the instincts of the poor were anything but law-abiding, and the authority of church and manor house seemed remote. In these areas, labouring society frequently consisted, on one hand, of a core of indigenous peasants with sizeable holdings and a relatively high standard of living; and, on the other, of an ever growing number of poor squatters and wanderers … more prone to pick up new ways and ideas. It was primarily in heath and forest areas … that the vagrant religion of the Independents found a footing in rural communities.'[203]

Everitt concluded that this independent culture was linked to the growth of mercantile enterprise:

> 'By 1640 the community of wayfaring merchants covered the whole of the country. It members were often familiar with the towns and villages of a half a dozen different counties … Its

[203] Everitt (1967a), 462,463. See also the discussion of the contrast between pastoral and arable areas in Thirsk (1967), 14.

> spirit of speculation and adventure ran counter to the stable traditions of the English peasantry .. it is not fanciful to trace connection between the rapid spread of private trading in the early seventeenth century and the rapid rise of Independency. For Independency was … mobile, virile and impatient of human institutions, like the wayfaring community itself.'[204]

This type of independence was associated with the growth of individualism, a culture perhaps characteristic of England from the thirteenth century onwards.[205] It was also linked to the growth of capitalism, which itself was the result of the erosion of political control over individual freedoms. This political control extended to the power of the guilds, which were seen by the government, along with monopolies, as 'one of the traditional instruments of industrial control'.[206] Much of this development took place in rural areas, where the power of the guilds was progressively weakened:

> '… during the thirteenth century there was an increasing shift of industry away from urban areas to the countryside. … The growth of the rural cloth industry was partly enabled … by a rural location … [which] permitted cloth producers to take advantage of cheap labour away from the prohibitive restrictions of the guilds … 'the very existence of craft guilds or endeavours to establish them might encourage merchants to transfer their entrepreneurial activities to the countryside. Textile skills were traditional there and rural overpopulation made labour available …'[207]

---

[204] Everitt (1967b). There is a possible link between this type of independent trading and Shakespeare's father John Shakespeare. Both Shakespeare and his father were involved in the illegal hoarding of grain, along with local magistrates and townsmen, an example of late sixteenth century capitalism. See Razzell (1990), 16-20, 141-42

[205] Macfarlane (1978); Macpherrson (2010)

[206] Ashton (1961), 145.

[207] Unwin (1978), 136.

However, the early development of industry was not confined to rural areas and much took place in towns like Manchester, Birmingham and Leeds which were relatively free of corporate and guild controls. London was the biggest manufacturing centre of England during the eighteenth and early nineteenth centuries,[208] but activity was largely centred on Southwark south of the river. According to Barnett:

> 'The universality of manufacturing in London was still a feature of the 1840s when George Dodd recorded his impressions of both the City and Southwark. Of the former, he noted that in Shoe Lane there were "many factories for articles of copper, and also of brass, lead, tin, and other metals"; of the latter, he observed: "Those dwellers in and visitors to the Great Metropolis who cross from Southwark Bridge from the City to the Borough can scarcely fail to have observed the array of tall chimneys which meets the eye on either side of its southern extremity; each one serving as a kind of beacon or guide-post to some large manufacturing establishment beneath – here a brewery, there a saw-mill, further on a hat factory, a distillery, a vinegar factory, and numerous others. Indeed Southwark is as distinguishable at a distance for its numerous tall chimneys and the shrouds of smoke emitted by them, as London is for its thickly-congregated church-spires." '[209]

Southwark had long been an area beyond the control of the City – brothels, bear baiting and illegal theatrical productions[210] – but also

---

[208] Barnett (1998).

[209] Ibid, 38. William Blake lived in Lambeth and would have encountered many factories on his way into the City, and this may well have been the origin of his reference to the 'dark satanic mills'. See Notes & Queries in the *Guardian,* Wednesday 12 September 2012. For a description of the introduction of steam engines in London sawmills see Mayhew (1980b), 65.

[210] Anonymous (1658).

attracted unregistered artisans and foreigners who brought with them a range of industrial skills:

> 'The more the city became the commercial centre of England, the more the actual industries moved beyond the walls. The poorer craftsmen who did not have the money to set up shop within the city, and the 'foreigners' or unfree men – often including aliens – who were not qualified to do so, not having served an apprenticeship, tended to settle in the suburbs. Over such recalcitrant workers the [guild] companies found it difficult to assert any control, even when empowered to do so by statute or charter.'[211]

This was partly the result of the growth of London's population, which undermined the capacity of the City authorities to regulate industry in the suburbs.[212] This lack of regulation applied to the employment of young children who were used in a range of London industries, including factories and workshops.[213] Children were employed in all regions of England, with 'agriculture, small-scale manufacturing, and services … [providing] the majority of jobs for children.'[214] Humphries has recently emphasized the role of 'cheap and amenable female and child labour' in the industrial revolution, providing evidence to show 'that the classic era of industrialization, 1790-1850, saw an upsurge in child labour.'[215] The *First Report of the Employment of Children in Factories* published in 1833 detailed the incomes of adults and children in English and Scottish factories. The weekly wages were as follows:

---

[211] Johnson (1969), 313.
[212] Wallis (2002), 87.
[213] Davin (1996), 159. Dickens working in a blacking factory along with other boys is an example of this employment.
[214] Humphries (2010), 366.
[215] Humphries (2013), 693; Humphries (2010), 366.

Table 53: The Mean Weekly Wages of Adults and Children in English and Scottish Factories. [216]

Age Group	*Male Weekly Wages (Shillings)*	*Number of Cases*	*Female Weekly Wages (Shillings)*	*Number of Cases*
Below 11	2.1	1536	1.9	1543
11-16	4.0	7040	4.4	9340
16-21	9.2	3750	5.9	9844
21-26	16.9	2443	6.8	4886
26-31	18.5	1925	6.7	2333
31-36	19.7	1594	6.9	937
36-41	18.9	1308	6.6	856
41-46	18.5	996	6.4	435
46-51	17.8	769	6.4	317
51-56	16.6	471	5.9	157
56-61	15.8	338	5.7	116
61-81	13.0	338	6.7	102

The majority of people employed in these factories were young women and children, working for significantly lower wages than adult men. One witness to the commission stated that 'there is always plenty of fresh children ready to take work when this is to be had; if a man starts a new mill or night-shifts, he may be sure of hundreds of applicants.'[217] The availability and cheapness of labour of women and children was largely the result of a rapidly increasing population, with migration providing the mobility necessary for the functioning of the new industrial system.

England was one of the first countries to develop an economic system – modern capitalism – which involved the

[216] *First Report* (1968). The figures in Table 53 are calculated by aggregating the data on all individual factories in the report.
[217] First Report (1968), C2, 21.

systematic exploitation of labour surpluses.[218] As a part of this process, Lawrence Stone noted the changes that had taken place in English society during the sixteenth century as a result of population growth: 'the excess supply of labour relative to demand not only increased unemployment, but forced down real wages to an alarming degree ... [there was] a polarisation of society into rich and poor: the upper classes became relatively more numerous and their real incomes rose; the poor also became more numerous and their real incomes fell.'[219]

In addition to the role of surplus labour in the development of capitalism, the increasing numbers of the wealthy also had an impact on economic and social inequality. The pressure of their growing numbers led the aristocracy and gentry to increasingly monopolise elite positions in the army, church, navy, judiciary and civil service,[220] which in turn may have led the middle classes to focus more vigorously on trading and manufacturing activity. The increasing number of elite families pressurised the wealthy to exploit their capital assets more forcefully, through the enclosure of land and the growth of large farms in the countryside, and the development of the competitive system in industrial villages and towns.[221]

There is uncertainty about changes in the structure and distribution of wealth and income in eighteenth and nineteenth century England.[222] Lindert has summarized a number of partial conclusions to emerge from research on the topic:

---

[218] Stone (1966)).
[219] Ibid, 26-29, 49
[220] Razzell (2007), 229-251.
[221] Mayhew (1980), 16, 17; Chambers (1972); Shaw-Taylor (2012).
[222] Soltow (1968); Williamson (1980); Williamson (1985); Lindert (1986); Lindert (1987); Feinstein (1988); Horrell and Humphries (1992); Lindert and Williamson (1982); Lindert and Williamson (1983); Jackson (1994); Feinstein (1998); Lindert (2000a); Lindert (2000b);Humphries (2013).

> 'The only period between 1688 and 1914 in which the rent/ wage ratio clearly rose was circa 1750-1810, roughly the period in which the social tables [of Gregory King, Massie and others] show their only rise [of income] in the top-decile and top-quintile … By contrast the separate estimates of wealth-holding inequality and of earnings inequality do not follow the same chronology … When one follows the average levels of estimated new worth by social classes – landed gentry, merchants, yeomen, craftsmen, and so forth – one finds a striking widening of the wealth gaps between 1810 and 1875. The top landed groups and merchants accumulated at a prodigious rate, it would seem, with their wealth growing faster than that of professionals, shopkeepers, yeomen, or craftsmen … [although] even the middling groups gained in absolute real wealth and held their share of the population, instead of slipping down into the proletariat.'[223]

Lindert believes that demographic factors were more important than economic variables in the growth of inequality during the period 1760-1810,[224] although he implies that the widening of inequality in the subsequent period may have been due more to economic forces. He has linked these different interpretations with two distinct intellectual traditions: the 'first follows Malthus and Ricardo in inferring that income gaps were destined to grow wider as a rising population pressed against land, pushing workers down to subsistence while landowners prospered. The second, Marxian tradition implied that the industrial forces would cause the same widening.'[225] These two intellectual traditions can be partly reconciled by focusing on the concept of 'surplus labour',[226] and

[223] Lindert (2000a) 175-178.
[224] Lindert (2000b), 6.
[225] Lindert (2000c), 11.
[226]This is following in the tradition of Lewis's work on the role of surplus labour in economic development. See Lewis (1954). Lewis's work has

this is a core feature of demographic and economic development in England during the eighteenth and nineteenth centuries.

Lindert acknowledged that his numbers were 'very tentative and subject to a wide range of error.'[227] Also, there is considerable uncertainty about wealth distributions because of the changing structure of the population:

> 'When generations are being compared, however, it might be misleading to compare the fortunes of persons with the same occupation. In what sense were the yeomen or shopkeepers of 1875 the descendants of the yeomen and shopkeepers of 1740? The whole population grew, some occupations grew faster than others, and individual family lines rose and fell through the occupational ranks. Marx, Engels, and other pessimistic critics might have been on the mark if the lowest-ranked occupations were a rising share of the labour force, netting many of the descendants of the previous middle classes.'[228]

Baptism registers frequently include information on the occupations of fathers, and after 1813 this became a compulsory provision. These registers have been used by the Cambridge Group in their research project on the long-term occupational structure of England. One of the most fruitful sources is that for the county of Bedfordshire, and a long-term comparison shows an increase in the proportion of labourers from 45% in 1698-1724 (945/2101) to 66% in 1813-20 (2230/3379).[229] However there is a major problem with

---

influenced the thinking of a number of subsequent scholars including Fei and Ranis. See Fei and Ranis (1964). *Development of the Labour Surplus Economy: Theory and Policy*. Illinois.

[227] Lindert (1980), 706.

[228] Lindert (1986), 1139.

[229] Source of this data is UK Data Archive UKDA/5397. The parishes are: Biddenham, Cardington, Clapham, Clifton, Eaton Bray, Henlow, Houghton Regis, Kempston, Keysoe, Langford, Little Barford, Little Staughton, Maulden, Meppershall, Odell, Podington, Potton, Pulloxhill,

the use of baptism registers, which can be illustrated by the Bedfordshire registers.

Analysis of baptism registers for the 124 parishes in the county for post-1813 period indicates that the proportions of labourers were as follows: 1813-19: 60% (9832/16375); 1820-29: 64% (16603/26039); 1830-39: 64% (19031/29621); 1840-49: 62% (17111/27406). These are very high percentages and a comparison with census data reveals that they are unrepresentative. The 1841 Bedfordshire Census indicates that 47% of occupied males were labourers (12404/26220),[230] compared to 62% (1648/2650) in baptism registers for the same year. A more exact comparison for 1851 reveals an identical disparity: 47% of males aged 20-50 were labourers in the census,[231] as against 62% of fathers (5280/8582) in the baptism registers during 1849-51.

There is a problem with all evidence based on baptism registers, as it assumes that 'fertility differences between major occupational groups were limited'.[232] The information in Chapter 4 on socio-economic status and fertility/nuptiality in the eighteenth century indicates that this was not the case, and that the fertility of farmers and other prosperous socio-economic groups had reduced significantly at a time that had stayed fairly stable amongst poorer groups. This would explain the discrepancy between the baptism register and census data above, as the fertility of labourers probably remained more-or-less constant as it was diminishing elsewhere.

Renhold, Souldrop, Southill, Tilbrook Tilsworth, Upper Gravenhurst, Wrestingworth. The quality of the data is very high with only 50 cases with no information on occupation in the early period – 2% – and 18 – 1% – in the later period.

[230] Occupation Abstract, England and Wales 1841.

[231] Enumeration Census 1851. This figures includes all types of labourer enumerated in the census, to allow for comparison with the baptism registers which do not distinguish different types of labourer.

[232] Shaw-Taylor (2012)

The Cambridge Group has also used baptism register returns to calculate the labourer/farmer ratio in order to study the growth of rural capitalism.[233] However, there is a marked discrepancy between the baptism register and census data for Bedfordshire. The ratio of labourers to farmers in the baptism registers for 1849-51 was 18.0 (5280 over 294) and in the 1851 Census 9.5 (10919 over 1148).[234]

There is currently no overall consensus on changes in economic inequality and levels of real income in the eighteenth and early nineteenth centuries,[235] partly because of the uncertain structure of occupations and the unknown incidence of male unemployment and the employment of women and children.[236] However, the development of rural capitalism in the sixteenth and seventeenth centuries is now widely recognised as a prelude to the general growth of industrial capitalism in the eighteenth and nineteenth centuries.[237]

In the absence of reliable national evidence, it is not possible to satisfactorily resolve any of these difficulties. Given the uncertain quantitative data, it is necessary to turn to literary evidence which suggests that labourers became increasingly

---

[233] Shaw-Taylor (2012).

[234] The census data relates to males aged between 20 and 50. All types of farmers and labourers were used in order to calculate these comparisons.

[235] See footnote 222.

[236] For a discussion of increasing numbers of women and children in industrial and agricultural occupations see Pinchbeck (1981), 44, 53, 183; Honeyman (2000), 72; Humphries (2013), 693. On unemployment Mayhew wrote in the middle of the nineteenth century that 'in the generality of trades the calculation is that one-third of the hands are fully employed, one third partially, and one third unemployed throughout the year.' Mayhew (1980), 14.

[237] Chambers (1972); Whittle (2000); Crafts and Harley (2002); Shepard and Spicksley (2011); Shaw-Taylor (2012).

pauperised in the late eighteenth and early nineteenth century.[238] One of the most detailed accounts was provided by the Reverend John Howlett, who had been the Vicar of Great Dunmow in Essex for about 50 years. Describing the condition of labourers in his parish he wrote in 1796:

> '… for the last forty or fifty years, some peculiarly favoured spots excepted, their condition has been growing worse and worse, and is, at length, become truly deplorable. Those pale famished countenances, those tattered garments, and those naked shivering limbs, we so frequently behold, are striking testimonies of these melancholy truths.'[239]

He argued that these developments were the result of 'the rapid increase of population on the one hand and from the introduction of machines and variety of inventions … [which have led to] more hands than we are disposed or think it advantages to employ; and hence the price of work is become unequal to the wants of the workmen.'[240] He compiled figures of income and expenditure, using details of wages from farmers' wage books and local knowledge of family incomes and consumption, for the two ten-year periods, 1744-53 and 1778-87. The annual expenditure per family in the first period was £20.11s.2d and earnings £20.12.7d, leaving a surplus of 1s.5d. In the second period the figures were £31.3s.7d and £24.3.5d, leaving a deficit of £7.0s.2d.[241] Howlett concluded that

---

[238] For an overall account of this evidence see Taylor ((1969); Inglis (1972); Vincent (1981); Humphries (2010). For a detailed discussion of changing poverty in the first half of the nineteen century see Mayhew (1980), 1-29.
[239] Howlett (1796), 2. For a similar account of the condition of labourers, see Davies (1796), 7.
[240] Howlett (1796), 19.
[241] Ibid, 48.

> ‘Of this deficiency the rates have supplied about forty shillings; the remaining £5 have sunk the labourers into a state of wretched and pitiable destitution. In the former period, the man, his wife, and children, were decently clothed and comfortably warmed and fed: now on the contrary, the father and mother are covered with rags; their children are running about, like little savages, without shoes or stockings to their feet; and, by day and night, they are forced to break down the hedges, lop the trees, and pilfer their fuel, or perish with cold.’[242]

That this was not an isolated instance, was confirmed by Cobbett, who had practised as a farmer, and travelled extensively in the South of England, gave an account of the changes in rural life that had occurred in his lifetime. By 1805 he came face to face with the poverty of southern agricultural workers:

> ‘The clock was gone, the brass kettle was gone, the pewter dishes were gone; the warming pan was gone … the feather bed was gone, the Sunday-coat was gone! All was gone! How miserable, how deplorable, how changed the Labourer’s dwelling, which I, only twenty years before, had seen so neat and happy … The pulling down of 200,000 small houses and making the inhabitants paupers were not an improvement.’[243]

The poverty of rural labourers was illustrated in an autobiographical account published in *Macmillan’s Magazine* in 1861:

> ‘I was born in Wimbush, near Saffron Walden, in Essex. My father was a labouring man, earning nine shillings a week at the best of times; but his wages were reduced to seven

[242] Ibid, 49.
[243] Cobbett (2001), x, xii.

shillings. There was a wonderful large family of us – eleven was born, but we died down to six. I remember one winter, we was very bad off, for we boys could get no employment, and no one in the family was working but father. He only got fourteen pence a day to keep eight of us in firing and everything. It was a hard matter to get enough to eat.'[244]

A more detailed account of the life of agricultural labourers was provided by the *Morning Chronicle Survey* in the middle of the nineteenth century:

'Their labour is at the command of any one who bids for it; and as their employment is precarious, and their wages fluctuating, their lives are spent, in the majority of cases, in constant oscillation between their homes and the workhouse, with no alternative beyond but starvation or the goal … If the reader will accompany me, I shall lead him into a cabin constituting the abode of [the labourer] … There are but two rooms in the house – one below and the other above … the glass in window … [in] the lower one is here and there stuffed with rags, which keep out the air and sunshine … At one corner a small rickety table, while scattered about are three old chairs – one without a back – and a stool or two, which, with … a shelf or two for plates, tea-cups, etc. constitute the whole furniture of the apartment … As you enter, a woman rises … [and] has an infant in her arms, and three other children, two girls and a boy, are rolling along the damp uneven brick floor at her feet. They have nothing on their feet, being clad only down to the knees in similar garments of rag and patchwork. They are filthy … There are two boys who are out with their father at work … the mother takes the pot from the fire, and pours out of it into a large dish of a quantity of potatoes. This,

[244] Humphries (2013), 693, 694.

together with a little bread and some salt butter for the father and the two eldest boys, forms the entire repast.'[245]

Cobbett linked the pauperisation of labourers in the south with the decline of the living-in system and the increasing wealth of farmers:

'[The] farm-house was formerly the scene of plain manners and plentiful living. Oak clothes-chests, oak chest of drawers, and oak tables to eat on, long, strong, and well supplied with joint stools … there were, in all probability, from ten to fifteen men, boys and maids … [but now] a *parlour*! Aye, and a carpet and bell-pull too! ... [and a] mahogany table, and the fine chairs, and the fine glass … And … decanters, the glasses, the "dinner set" of crockery ware … it [is now] *Squire* Charington and the *Miss* Charingtons … transmuted into a species of mock gentle-folks …'[246]

He argued that this polarisation of wealth was associated with the development of capitalism, with bankers and city merchants playing a significant role in the consolidation of estates and farms:

'The small gentry, to about the third rank upwards … are all gone, nearly to a man, and the small farmers with them. The Barings [merchant bankers] alone have, I should think, swallowed up thirty or forty of these small gentry without perceiving it … The Barings are adding field to field and tract to tract in Herefordshire; and as to the Ricardos, they seem to be animated with the same laudable spirit ... [acquiring a number of] estates …'[247]

[245] Razzell and Wainwright (1973), 3-5.
[246] Cobbett (2001), x, xviii, 358.
[247] Ibid, 223.

Cobbett also described the way the gentry and aristocracy employed urban stock brokers to speculate in stocks and shares, directly linking rural and urban capitalism,[248] which is confirmed by Stone's account of the economic activities of the aristocracy in the eighteenth and nineteenth centuries:

> 'By 1750 there were few great landlords who did not have some money – often a great deal – in the public funds of the Bank of England. In this sense they were themselves becoming inextricably linked with the monied interest, and their mental attitudes to banking and stock speculation changed accordingly … Others poured surplus cash into canal companies and turnpike trusts in the eighteenth century, and into railroad companies and dockyards in the nineteenth. From the early seventeenth century onward many were deeply involved in urban development of London.'[249]

Although real wages were higher in the North of England,[250] there is some evidence that the pauperisation of the working class was not confined to the South of England.[251] Charles Shaw in his autobiography described the conditions of workers in the Staffordshire Potteries in the 1830s and 1840s:

> 'All the great events of the town took place … [in] the market place. During the severity of winter I have seen one of its sides nearly filled with stacked coals. The other side was stacked with loaves of bread, and such bread. I feel the taste of it even yet, as if made of ground straw, and alum, and plaster of Paris. These things were stacked there by the parish authorities to

[248] Ibid, 6, 115.
[249] Stone (1995), 189.
[250] Mitchell and Deane (1971), 346-47.
[251] See for example Thompson (1980) and Razzell and Wainwright (1973).

relieve the destitution of the poor. Destitution, for the many, was a chronic condition in those days, but when winter came in with its stoppage of work, this destitution became acute, and special measures had to be taken to relieve it. The crowd in the market-place on such a day formed a ghastly sight. Pinched faces of men, with a stern, cold silence of manner. Moaning women, with crying children in their arms, loudly proclaiming their sufferings and wrongs. Men and women with loaves or coals, rapidly departing on all sides to carry some relief to their wretched homes – homes, well, called such … This relief, wretched as it was, just kept back the latent desperation in the hearts of these people.'[252]

Population was a critical part of the pauperisation of labourers and the growth of economic inequality linked to the development of industrial capitalism. Deane and Cole directly associated population growth with economic development in the eighteenth century as follows:

'It was not until economic expansion was well under way, in the 1760s and seventies, when the pressures of a growing population were beginning to stimulate investment in measures designed to economise other resources, such as land (enclosures) and coal (canals), that the great labour-saving inventions of the eighteenth century laid the basis for the revolution in the textile industries and the introduction of the factory system … the quest for technical improvement which gave rise to these revolutionary innovations was itself stimulated by the great upsurge of population which began a generation before.'[253]

[252] Shaw (1980), 42-43.
[253] Deane and Cole (1969), 97

Harley has more recently concluded that 'the emergence of Britain's modern growth depended more on a long history of capitalism than on the industrial revolution.'[254] Paradoxically, Malthus was one of the first to recognise the role of surplus labour in these developments, acknowledging the reality of contemporary capitalist society by concluding that 'farmers and capitalists are growing rich from the real cheapness of labour.'[255]

[254] Harley (2014), 492.
[255] Malthus (1992), 28.

Chapter 7: Conclusion.

The relationship between economic development and population growth has long been a matter of controversy.[256] The debate has not only interested demographers but has attracted the attention of economic historians and other social scientists concerned with explaining economic and social change. Much of this debate has been influenced by the assumptions of classical economics, summarized by Adam Smith in his conclusion that 'the demand for men, like that for any other commodity, necessarily regulates the production of men; quickens it when it goes on too slowly, and stops it when it advances too fast.'[257] His analysis influenced the work of Malthus, Marx, Marshall and others, who all assumed the primacy of economics over demography. Keynes accepted that population influenced levels of aggregate demand – he was a strong admirer of Malthus – but had little or nothing to say about the impact of population growth on the supply side, in particular the supply of labour.[258] Malthus influenced all the above economists, having argued that the main impact of economic factors on population change occurred through the mechanism of nuptiality, with shifts in the standard of living influencing age at first marriage and the propensity to marry.

The evidence presented in this book indicates that it was not fertility but mortality that was the main driver of population growth in England during the seventeenth, eighteenth and early nineteenth centuries, and that mortality levels were not fuelled mainly by poverty but by disease environment. This conclusion affects the theoretical assumptions about the relationship between economic and demographic development. The reduction of infant and child mortality was not brought about mainly by economic

[256] Hodgson (1988); and Simon (1986).
[257] Smith (1976), 98. Smith emphasized the impact of poverty on mortality. Ibid, 97.
[258] Keynes (1961) and Keynes (1973).

factors, but was probably mainly due to autonomous declines in disease incidence and shifts in attitude towards health and the environment, linked to growing levels of literacy. There is a similar process in many developing countries today, with reductions of mortality occurring largely without economic development.[259] Much of this diminished mortality has resulted from WHO and other health programmes of vaccination, re-hydration, the eradication of malaria and a range of other medical and hygienic improvements.

On the central argument of the present book, this process is similar to the situation in England during the eighteenth and nineteenth centuries, where mortality fell not as a result of economic development, but as a consequence of the transformation of the disease environment. The marked reduction in adult mortality preceded the events of the industrial revolution of the eighteenth century, and is consistent with Habakkuk's thesis about the impact of population growth on economic development.

If the above argument is correct, it has general implications for the analysis of demography and its relationship to economics and sociology as disciplines. Most economists have followed Adam Smith and Malthus in assuming that demography is a function of economics, playing at best a very secondary role in economic and social development.[260] Marxist economists and sociologists have attempted to modify this view by stressing the role of surplus labour in the development of capitalism, but they see this surplus resulting mainly from the development of technology and the more efficient exploitation of labour. Although technology has undoubtedly played a major part in creating surplus labour, in the early phase of the industrial revolution it was only a secondary factor.

---

[259] See Easterlin (1999); Cutler, Deaton and Lleras-Muney (2006), 110; Easterlin (2012)

[260] See Coontz, (1988) and Simon (1986) for a discussion of this topic.

There are similarities between the historical demography of England and the demographic experience of developing countries, although the scale and rapidity of falling infant and child mortality has been greater in the latter.[261] Developing countries have been able to benefit from some of the medical technologies developed elsewhere, partly explaining their more rapid mortality reduction. However, many of the processes responsible for the falls in mortality were similar in both cases.

Population growth in the developing world has largely been shaped by mortality reductions, most of which occurred as a result of non-economic developments. Preston concluded from a statistical analysis of available evidence that 'factors exogenous to a country's current level of income probably accounted for 75-90 per cent of the growth in life expectancy for the world as a whole between the 1930s and 1960s. Income growth *per se* accounts for only 10-25 per cent.'[262] More recently, Easterlin has concluded that 'all of the modern improvement in life expectancy is due to advances in health technology, not to higher GDP per capita.'[263] Theories of demographic transition have also tended to emphasize the central role of economic forces in population change, but reductions in mortality and increases in population growth have occurred largely without economic development.[264]

Demographic factors have played an independent role in initiating economic change and continue to be a major determinant of the expansion of world capitalism. Multi-national companies move their operations from country to country and exploit labour surpluses for both manufacturing industry and the service sector. These economic developments have been associated with a

[261] However, combined infant and child mortality amongst the general population fell by approximately 50% between 1750-99 and 1800-49 in London, similar to the reductions in many developing countries. See the *United Nations Development Programme* (1992).
[262] Preston (1975).
[263] Easterlin (2012), 304.
[264] Caldwell (1986); Cutler, Deaton and Llera-Muney (2006), 110.

polarisation of wealth, with increases in economic and social inequality.[265] However, much of this inequality is a result of rapid population growth due to improvements in health not linked to economic development. As in England, the growth of population in developing countries has created a surplus of labour, which has been harnessed by multi-national companies for profit maximisation. This surplus of labour has conferred an increasing advantage on those owning capital, a process which is only likely to alter when reductions in fertility stabilize levels of population growth, changing the balance of power between capital and labour, and shaping the long-term future of global capitalism

[265] For a discussion of a similar pattern of inequality in England during the eighteenth and nineteenth centuries see Lindert (2000a), (2000b), (2000c).

BIBLIOGRAPHY

ACKWORTH BURIAL REGISTER, Society of Genealogists' Library.

ALLEN, R.C. (2007). *Pessimism Preserved: Real Wages in the British Industrial Revolution*. Oxford University Department of Economics Working Paper 314.

ALLHALLOWS LONDONWALL BURIAL REGISTER, *Ancestry Online*.

ANDERSON, P. (1974), *Lineages of the Absolute State*. London.

ANONYMOUS (1658), *The City Law Showing the Customes, Franchcises, Liberties, Priviledges, and Immunities of the famous City of London.* London.

ARMSTRONG, W.A. (1981). The trend of mortality in Carlisle between the 1780s and the 1840s: a demographic contribution to the standard of living debate. *Economic History Review*, 34.

ASHTON, R. (1961). Charles I and the City. In F.J. Fisher (ed.), *Essays in the Economic and Social History of Tudor and Stuart England*. London.

AUSTEN. J. (1994). *The Complete Novels.* London.

BAKER, D. (1973). *The Inhabitants of Cardington in1782.* Bedfordshire Historical Record Society, 52.

BARNETT, C. (1970). *Britain and Her Army, 1509-1970: A Military, Political and Social Survey*. London.

BARNETT, D. (1998). *London, Hub of the Industrial Revolution: a Revisionary History*. London.

BARRON, O. (1906). *Northamptonshire Families: Victoria County History of Northamptonshire, Genealogical Volumes 1 and 2.* London.

BAXTER, R. (1926). *The Poor Husbandman's Advocate to Rich Racking Landlords*. London.

BENEDICTOW, O. (2012). New perspectives in medieval demography; the medieval demographic system. In M. Bailey and S. Rigby (eds.), *Town and Countryside in the Age of the Black Death.* Brepols.

BOULTON, J. (2000). Wage labour in seventeenth century London. *Economic History Review*, 49.
BRENNER, R. (1977). The origin of capitalist development: a critique of neo-Smithian Marxism, *New Left Review*, 104.
BRIGG, W. (1894). *Genealogical Abstracts of Wills Proved in the Prerogative Court of Canterbury: Register "Wotton", 1658,* Volume 1*,* Leeds.
BROWNLEE, J. (1915-16). The history of birth and death rates in England and Wales taken as a whole from 1570 to the present time. *Public Health,* 34.
BUER, M.C (1968). *Health, Wealth and Population in the Early Days of the Industrial Revolution.* London.
BURCHALL, J. (2014). *Sussex Court Depositions 1556-1693* (CD, the Parish Register Transcription Society).
BURGER, S.E. and ESREY, S.A. (1995). Water and sanitation: health and nutrition benefits to children. In P. Pinstrup-Anderson, D. Pelletier and H. Alderman (eds.), *Child Growth and Nutrition in Developing Countries*. Ithaca.
BURN, J.S. (1862). *The History of Parish Registers in England.* London.
CALDWELL, J. (1986). Routes to low mortality in poor countries. *Population and Development Review*.
CARLTON, C. 1995. *Going to the Wars: the Experience of the British Civil Wars, 1638-51.* London.
CAUSE PAPERS, *Borthwick Institute Online Website.*
CHAMBERS, J.D. (1965).The course of population change. In D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography.* London.
CHAMBERS, J.D. (1972). *Population, Economy and Society in Pre-industrial England*. Oxford.
CINNIRELLAN, F. (2008). Optimists or pessimists? A reconsideration of nutritional status in Britain, 1740-1865. *European Review of Economic History*, 12.

CLARK, G. (2007). The long march of history: farm wages, population, and economic growth, England 1209-1869. *Economic History Review*. 6.
CLARKSON, L.A. and CRAWFORD, F.M. *Feast and Famine: Food and Nutrition in Ireland 1500-1920*. Oxford.
COBBETT, W. (2001). *Rural Rides.* London.
COONTZ, S.H. (1998). *Population Theories and their Economic Interpretation.* London.
COX J.C. (1910). *The Parish Registers of England.* London.
CRAFTS, N.F.R. (1989). Real wages inequality and economic growth in Britain, 1750-1850: a review of recent research. In P. Scholliers (ed.), *Real Wages in 19th and 20th Century Europe Historical and Comparative Perspectives.* New York.
CRAFTS, N.F.R. and HARLEY, C.K. (2002). *Research Report 2002-13: Precocious British Industrialization: a General Equilibrium Perspective*.
CUTLER, D.M., DEATON, A.S. & LLERA-MUNEY, A. (2006). The determinants of mortality. *Journal of Economic Perspectives*, 20 (3).
DAVIES, D. (1796). *The Case of Labourers in Husbandry.* Dublin.
DAVIN, A. (1996). *Growing Up Poor: Home, School and Street in London, 1870-1914.* London.
DEANE W.A. and COLE, W.A. (1969). *British Economic Growth 1688-1959: Trends and Structure*. Cambridge.
DENDY, F.W. (ed.) (1899). *Extracts from the Records of the Merchant Adventurers of Newcastle-Upon-Tyne*. Durham: Surtees Society, 101.
DOBSON, M. (1997). *Contours of Death and Disease in Early Modern England.* Cambridge.
EARLE, P. (1991). *The Making of the English Middle Class: Business, Society and Family Life in London, 1660-1730.* London.
EARLE, P. A. (1994). *A City Full of People: Men and Women of London, 1650-1750*. London.

EASTERLIN, R.A. (1999). How beneficent is the market? A look at the modern history of mortality. *European Review of Economic History*, 3.
EASTERLIN, R.A. (2012). Cross-sections are history. *Population and Development Review*, 38 (Supplement).
ELLIOTT, V.B. (1978). *Mobility and Marriage in Pre-Industrial England.* Cambridge University Ph.D. Thesis.
ENUMERATION CENSUS 1851, Population Tables I, Volume II, England and Wales, Divisions I-VI.
ENUMERATION CENSUS 1861, Population Tables I, Volume II, England and Wales, Divisions I-VI.
ENUMERATION CENSUS 1851. *Ancestry Online.*
EVERITT, A. (1967a). Farm Labourers. In J. Thirsk (ed.), *The Agrarian History of England and Wales, 1500-1640*. Cambridge.
EVERITT, A. (1967b). The marketing of agricultural produce. In J. Thirsk (ed.), *The Agrarian History of England and Wales, 1500-1640*. Cambridge.
EVERSLEY, D.E.C. (1965). A Survey of population in an area of Worcestershire from 1660 to 1850 on the basis of parish registers. In D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography.* London.
FEI, J.C.H. and RANIS, G. (1964). *Development of the Labour Surplus Economy: Theory and Policy*. Illinois.
FEINSTEIN, C.H. (1988). The rise and fall of the Williamson curve, *Journal of Economic History*, 44.
FEINSTEIN, C.H. (1998). Pessimism perpetuated: real wages and the standard of living in Britain during and after the industrial revolution. *Journal of Economic History*, 58.
FINLAY, R. (1981). *Population and Metropolis: the Demography of London, 1580-1650*. Cambridge.
FIRST REPORT (1968). *First Report on the Employment of Children in Factories, 1833.* London.
GALLEY, C. (1998). *The Demography of Early Modern Towns; York in the Sixteenth and Seventeenth Centuries*. Liverpool.

GEORGE, M.D. (1966). *London Life in the Eighteenth Century*. London.
GIESE, L.L. (1995). Consistory Court Depositions, 1586-1611. *London Record Society,* 32.
GLASS, D.V. (1938). Fertility and economic status in London. *Eugenics Review*.
GLASS, D.V. (1965). Two papers on Gregory King. In D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography.* London.
GRIFITHS, G.T. (1926). *Population Problems of the Age of Malthus.* Cambridge.
GUHA, S. (1993). Nutrition, sanitation, hygiene, and the likelihood of death: the British army in India c. 1870-1920. *Population Studies,* 47.
HABBAKKUK, H.J. (1965). The economic history of modern Britian. In D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography*. London.
HAINES, R. and SHLOMOWITZ, R. (1998). Explaining the modern mortality decline: what can we learn from sea voyages? *Social History of Medicine,* 11.
HARLEY, C.K. (2014). British and European industrialization. In L. Neal and J.G. Williamson (eds.), *Capitalism: Volume 1: The Rise of Capitalism from Ancient Origins to 1848.* Cambridge.
HEBERDEN, W. (1801). *Observations on the Increase and Decrease of Different Diseases*. London.
HODGSON, D. (1988). Orthodoxy and revisionism in American demography. *Population and Development Review,* 14.
HOLLINGSWORTH, T.H. (1965). The demography of the English peerage. *Population Studies,* Supplement, 18.
HONEYMAN, K. (2000). *Child Workers in England, 1780-1820: Parish Apprentices and the Making of the Early Industrial Labour Force.* Aldershot: Ashgate.
HORRELL, S. and HUMPHRIES, J. (1992). Old questions, new data and alternative perspectives: families living standards in the industrial revolution. *Journal of Economic History*, Vol. 52.

HOUSTON, R. (1985). *Scottish Literacy and the Scottish Identity: Illiteracy and Society in Scotland and Northern England 1600-1800*. Cambridge.
HOUSTON, R. (1992). Mortality in early modern Scotland. *Continuity and Change*, 7.
HUCK, P. (1994). Infant mortality in nine industrial parishes in northern England, 1813-36. *Population Studies*, 48.
HUMPHRIES (2010). *Childhood and Child Labour in the British Industrial Revolution*. Cambridge.
HUMPHRIES, J. (2013). The lure of aggregates and the pitfalls of the patriarchal perspective: a critique of the high wages economy interpretation of the British industrial revolution. *Economic History Review* 66.
ICEM DATA online UK Data Archive.
INGLIS, B. (1972) *Poverty and the Industrial Revolution*. London.
JACKSON, R.V. (1994). Inequality of incomes and lifespans in England since 1688. *Economic History Review*, Vol. 47.
JOHNSON, D.J. (1969). *Southwark and the City.* Oxford.
JONES, R.E. (1980). Further evidence on the decline of infant mortality in pre-industrial England: north Shropshire, 1561-1810. *Population Studies*, 34.
JONES, E.L. and FALKUS, M.E. (1990). Urban improvement and the English economy in the seventeenth and eighteenth centuries. In P. Borsay (ed.), *The Eighteenth Century Town: 1688-1820. London.*
JUTIKKALA, E. and KAUPPINEN, M. (1971). The structure of mortality during catastrophic years in a pre-industrial society. *Population Studies*, 25.
KASAKOFF, A.B. and ADAMS, J.W. (1995). The effects of migration on ages at vital events: a critique of family reconstitution in historical demography. *European Journal of Population*, 11.
KEYNES, J.M. (1961). *Essays in Biography.* In G. Keynes (ed.), London.

KEYNES, J.M. (1973). *The Collected Writings of John Maynard Keynes*, Volume 7. London.
KRAUSE, J.T. (1965). The changing adequacy of English registration, 1690-1837. In D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography* . London.
LANDERS, J. (1991). London mortality in the 'long eighteenth century': a family reconstitution study. *Medical History,* Supplement No. 11.
LANDERS, J. (1993). *Death and the Metropolis: Studies in the Demographic History of London.* Cambridge.
LEE, R. and LAM, D. (1983). Age distribution adjustments for English census, 1821 to 1931, *Population Studies*, 37.
LETTSOM, J.C. (1774). *Medical Memoirs of the General Dispensary in London.* London.
LEWIS, W.A. (1954). Economic development and unlimited supplies of labour. *The Manchester School of Economic and Social Studies*, 22.
LINDERT, P.H. (1980). English occupations, 1670-1811. *Journal of Economic History*, 40.
LINDERT, P.H. (1983). English living standards, population growth, and Wrigley-Schofield. *Explorations in Economic History.* 20.
LINDERT, P.H. (1986). Unequal English wealth since 1670. *Journal of Political Economy*, 94, 6.
LINDERT, P.H. (1987). Who owned Victorian England? The debate over landed wealth and inequality. *Agricultural History*, 61.
LINDERT, P.H. (2000a). Three centuries of inequality in Britain and America. In A.B. Atkinson and F. Bourguignon (eds.), *Handbook of Income Distribution.* Amsterdam.
LINDERT, P.H. (2000b). Early inequality and industrialisation: introduction. *Journal of Income Distribution* , 9.
LINDERT, P.H. (2000c). When did inequality rise in Britain and America? *Journal of Income Distribution*, 9.

LINDERT, P.H. and WILLIAMSON, J.G. (1982). Revising England's social tables, 1688-1812. *Explorations in Economic History*, 19.
LINDERT, P.H. and WILLIAMSON, J.G. (1983). Reinterpreting Britain's social tables, 1688-1913. *Explorations in Economic History*, 20.
LONDON WILLS and PROBATES, 1507-1858, *Ancestry Online.*
LOUDON, I. (1992). *Death in Childbirth: an International Study of Maternal Care and Maternal Mortality, 1800-1950.* Oxford.
LOUDON, I. (2000). *The Tragedy of Child bed Fever.* Oxford.
LUCASSEN, J. (1989). The standard of living debate and social history: a comment. In P. Scholliers (ed.), *Real Wages in 19th and 20th Century Europe Historical and Comparative Perspectives.* New York.
MACFARLANE, A. (1978). *The Origins of English Individualism.* Oxford.
MACPHERSON, C.B. (2010). *The Political Theory of Possessive Individualism.* Oxford.
MALTHUS, T.R. (1992). Ed. by D. Winch. *An Essay on the Principal of Population*, Volume 2. Cambridge.
MARKS, I. and WORBOYS, M. (1997). *Migrants, Minorities and Health.* London.
MAYHEW, H. (1980). *The Morning Chronicle Survey of Labour and the Poor: the Metropolitan Districts*, Volume 1. Firle.
MAYHEW, H. (1980b). *The Morning Chronicle Survey of Labour and the Poor: the Metropolitan Districts*, Volume 5. Firle.
MITCHELL, B.R. and DEANE, P. (1971). *Abstracts of British Historical Statistics*. Cambridge.
MOKYR. J. and O'GRADA, C. (1989). The heights of Irishmen and Englishmen in the 1770s: some evidence from the East India Company records. *Eighteenth Century Ireland.* 4.
MORSA, D. (1989). Is it justified to use real wages as a standard of living index? In P. Scholliers (ed.), *Real Wages in 19th and 20th Century Europe Historical and Comparative Perspectives* . New York.

NATIONAL PROBATE CALENDAR, *Online Historical Population Reports.*
NORFOLK CHANCERY DEPONENTS, 1649-1714, (Society of Genealogists, NF/G36).
OCCUPATION ABSTRACT 1841, *Online Historical Population Reports.*
O'GRADA, C. (1994). *Ireland: a New Economic History.* Oxford.
PELLICANI, L. (1994). *The Genesis of Capitalism and the Origins of Modernity.* New York.
PINCHBECK, I. (1981). *Women Workers and the Industrial Revolution, 1750-1850*. London.
PLACE, F. (1994). *Illustrations and Proofs of the Principles of Population.* London.
PORTER, R. (1991). Cleaning up the Great Wen: public health in eighteenth century London. In W.F. Bynum and R. Porter (eds.), *Living and Dying in London (Medical History, Supplement No. 11)*. London.
PORTER, S. (2009). *The Great Plague.* Stroud.
PRESTON, S.H. (1975). The changing relation between mortality and level of economic development. *Population Studies*, 29.
RAZZELL, P.E. (1967). Population growth and economic change in eighteenth and early nineteenth century England and Ireland. In E.L. Jones and G.E. Mingay (eds.), *Land, Labour and Population in the Industrial Revolution*. London.
RAZZELL, P.E. (1990). *William Shakespeare: the Anatomy of an Enigma.* London.
RAZZELL, P.E. (1994). *Essays in English Population History*. London.
RAZZELL, P.E. (2003). *The Conquest of Smallpox.* London.
RAZZELL, P.E. (2007). *Population and Disease: Transforming English Society.* London.
RAZZELL, P.E. (2011a). Infant mortality in London, 1538-1850: a methodological study. *Local Population Studies*, 87.
RAZZELL, P.E. (2011b). Living same-name siblings in England, 1439-1851. *Local Population Studies*, 87.

RAZZELL, P.E. (2012). Living same-name siblings and English historical demography: a commentary. *Local Population Studies*, 88.
RAZZELL, P.E. and WAINWRIGHT, R.W. (1973). *The Victorian Working Class: Selections from Letters to the Morning Chronicle*. London.
RAZZELL, P.E. and SPENCE, C. (2006). The hazards of wealth: adult mortality in pre-twentieth century England. *Social History of Medicine*, 19.
RAZZELL, P.E. and SPENCE, C. (2007). The history of infant, child and adult mortality in London, 1550-1850. *The London Journal*, 32.
RAZZELL, P.E., SPENCE, C. and WOOLLARD M. (2010). The evaluation of Bedfordshire burial registration, 1538-1851. *Local Population Studies*, 84.
REGISTRAR-GENERAL'S SECOND ANNUAL REPORT, *Online Historical Population Reports.*
REGISTRAR-GENERAL'S FOURTH ANNUAL REPORT, *Online Historical Population Reports.*
REGISTRAR-GENERAL'S FIFTH ANNUAL REPORT, *Online Historical Population Reports.*
REGISTRAR-GENERAL'S EIGHTH ANNUAL REPORT, *Online Historical Population Reports.*
REGISTRAR-GENERAL'S TWENTY-THIRD ANNUAL REPORT, *Online Historical Population Reports.*
REGISTRAR-GENERAL'S TWENTY-FOURTH ANNUAL REPORT, *Online Historical Population Reports.*
REPORT OF THE SELECT COMMITTEE ON PAROCHIAL REGISTRATION (Parliamentary Papers, 1833/ XIV).
RILEY. J.C. (1987). *The Eighteenth Century Campaign to Avoid Disease.* Basingstoke.
RUGGLES, S. (1992). Migration, marriage, and mortality: correcting sources of bias in English family reconstitutions. *Population Studies*, 46.
SHAW, C. (1980). *When I Was a Child.* Firle.

SHAW-TAYLOR, L. (2012). The rise of agrarian capitalism and the decline of family farming. *Economic History Review*, 65.
SHEPARD, A. and SPICKSLEY, J. (2011). Worth, age, and social status in early modern England. *Economic History Review,*64.
SIMON, J. (1986). *Theory of Population and Economic Growth.* Oxford.
SMITH, A. (1976). *An Inquiry into the Nature and Causes of the Wealth of Nations,* Vol. 1. Oxford.
SOLTOW, L.C. (1968). Long-run changes in British income inequality. *Economic History Review*, Vol. 21.
SOUDEN, D. (1981). *Pre-Industrial Migration Fields* (Ph.D. University of Cambridge).
ST. BOTOLPH ALDGATE PARISH CLERK'S
MEMORANDUM BOOKS, UK Data Archive Study Number 7244.
ST. DUNSTAN & ALL SAINTS STEPNEY MARRIAGE REGISTER, *Ancestry Online*.
ST. DUNSTAN & ALL SAINTS STEPNEY BURIAL REGISTER, *Ancestry Online*.
ST. GEORGE BLOOMSBURY MARRIAGE REGISTER, *Ancestry Online.*
STEPHENS, W.B. (1990). Literacy in England, Scotland, and Wales, 1500-1900. *History of Education Quarterly*, 30.
STONE, L. (1966). Social mobility in England, 1500-1700. *Past and Present*, 33.
STONE, L. (1995). *An Open Elite: England 1540-1880.* Oxford.
SUPPLEMENT REGISTRAR-GENERAL'S TWENTY-FIFTH ANNUAL REPORT
SZRETER, S. and MOONEY, G. (1998). Urbanization, mortality and the standard of living debate: new estimates of the expectation of life at birth in nineteenth-century British cities. *Economic History Review*, 51.

SZRETER, S. and GARRETT, E. (2000). Reproduction, compositional demography, and economic growth: family planning in England before the fertility decline, *Population and Development Review*, 26
TATE, W.E. (1969). *The Parish Chest.* Cambridge.
TAYLOR, G. (1969) *The Problem of Poverty, 1660-1834.*London.
THIRSK, J. (1967). The farming regions of England. In J. Thirsk (ed), *The Agrarian History of England and Wales, 1500-1640*. Cambridge.
THOMPSON, E.P. (1980). *The Making of the English Working Class*. London.
UNITED NATIONS DEVELOPMENT PROGRAMME (1992). *Global Dimensions of Human Development: Human Development Report*.
UNWIN, P.T.H. (1978). Town and trade 1066-1500. In R.A. Dodgson and R.A. Butlin (eds.), *An Historical Geography of England and Wales*. London
UTTERSTROM, G. (1965). Two essays on population in eighteenth century Scandinavia. In D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography*. London.
VICAR-GENERAL'S MARRIAGE ALLEGATIONS, 1660-68. (1892). (Harleian Society, Volume 33)
VINCENT, D. (1981). *Bread, Knowledge and Freedom: a Study of Nineteenth Century Working Class Autobiography*. Chicago.
WALLIS, P. (2002). Controlling commodities: search and reconciliation in the early modern livery companies. In I.A. Gadd and P. Wallis (eds.), *Guilds, Society and Economy in London, 1450-1800*. London.
WARRAND, D. (ed). (1907). *The Landed Houses of Hertfordshire: Victoria County History of Hertfordshire, Genealogical Volume*. London.
WEBB, C. (1996). *London Apprentices, Volume 2.* Society of Genealogists.

WEBB, C. (1999). *London Apprentices, Volume 27.* Society of Genealogists.
WEBB, C. (1999). *London Bawdy Courts, 1703-13.* London.
WEBB, C. (2000). *London Apprentices, Volume 33.* Society of Genealogists.
WEBB, C. (2006). *London Apprentices, Volume 43.* Society of Genealogists.
WEBB, C. (2008). *London Apprentices, Volume 48.* Society of Genealogists.
WHITTLE, J. (2000). *The Development of Agrarian Capitalism: Land and Labour in Norfolk 1440-1580.* Oxford.
WILLIAMSON, J.G. (1980). Earnings inequality in nineteenth century Britain. *Journal of Economic History*, 40.
WILLIAMSON, J.G. (1985). *Did British Capitalism Breed Inequality?* Boston.
WOODWARD, D. (1994). The determination of wage rates in early modern north of England. *Economic History Review*, 47.
WORTH OF WITNESSES IN THE ENGLISH CHURCH COURTS, 1550-1728, UK Data Archive AHDS History SN 5652.
WRIGLEY, E.A. and SCHOFIELD, R.S. (1981). *The Population History of England, 1541-1871*. London.
WRIGLEY, E.A. and SCHOFIELD, R.S. (1989). *The Population History of England, 1541-1871*. London, Paperback Edition.
WRIGLEY, E.A., DAVIES, R.S., OEPPEN, J.E. and SCHOFIELD, R.S. (1997). *English Population History from Family Reconstitution 1580-1837*. Cambridge.
WRONG, J. (1958). Class fertility differentials before 1850, *Social Research*, 25.

Asian Population Growth and the Increase of Socio-Economic Inequality in Britain.

Introduction.

There is historical evidence that English population growth in the eighteenth and nineteenth centuries increased socio-economic inequality by creating labour surpluses.[1] Thomas Piketty has recently analysed patterns of economic status, including a significant rise in inequality in Britain since the 1980s.[2] He has attributed these changes mainly to economic factors, but the present paper presents evidence to show that demographic changes linked to disease have had an independent influence on levels of inequality.

The period since the 1970s is one of economic globalisation, and inequality has been significantly shaped by global demographic and technological trends. As with the history of England, most world-wide population growth has resulted from reductions in mortality. In 1975, Preston concluded from a statistical analysis of available data that "factors exogenous to a country's current level of income probably accounted for 75-90 per cent of the growth of life expectancy for the world as a whole between the 1930s and 1960s. Income growth *per se* accounts for only 10-25 per cent."[3] More recently Easterlin has concluded that 'all of the modern improvement in life expectancy is due to advances in health technology, not to higher GDP per capita.'[4] This has occurred sometimes in very poor countries which have benefited from medical and other forms of aid.[5] Much of this diminished mortality occurred in Communist countries which had good educational and public health systems, but low per capita income growth.[6] This has invariably happened during periods of high fertility as a part of the demographic transition),[7] leading to the creation of labour surpluses.

These labour surpluses allowed some developing countries to create highly competitive export industries because of the cheapness of their labour. However, the most important global demographic development was that which occurred in Asia.

Table 1: Life Expectancy and Population Growth in Asia, 1950-2001.[8]

Year	Life Expectancy	Year	Population
1950	41.6	1955	1,546,143,227
1973	57.5	1975	2,394,338,004
1990	65.5	1990	3,221,341,718
2001	67.1	2000	3,730,370,625

Life expectancy in Asia increased particularly rapidly in the period between 1950 and 1973, resulting in significant population growth in the decades between 1955 and 1990.

The most important economy in Asia was China. Its population grew rapidly after 1960, also fuelled largely by increasing life expectancy.

[1] P.E. Razzell, *Mortality, Marriage and Population Growth, 1550-1850,* 2016, pp. 99-118.
[2] T. Piketty, *Capital in the Twenty-First Century*, 2014, pp. 316, 319, 323, 344.
[3] S.H. Preston, 'The changing relation between mortality and level of economic development', *Population Studies*, 29, 1975, pp. 231-248.
[4] R.A. Easterlin, 'Cross-sections are history', *Population and Development Review*, 38 Supplement, 2012, p. 304.
[5] J. Caldwell, 'Routs to low mortality in poor countries', *Population and Development Review*, ??? 1986
[6] J. Riley, *Low Income, Social Growth, and Good Health: a History of Twelve Countries,* 2007.
[7] S. Harper, *How Population Change Will Transform Our World*, 2016.
[8] World Bank Asian Data Online

Table 2: Life Expectancy and Population Growth in China, 1960-2015.[9]

Year	Life Expectancy (Years)	Population Size
1960	43.8	667,070,000
1980	66.6	981,235,000
2015	76.1	1,379,000,000

Most of the growth of China's population occurred between 1949 and 1975,[10] (during a period of poverty and stagnating incomes, including the famine of 1959-61.[11] Riley has summarized the factors responsible for the decline of mortality after 1949 under three headings:

1. Communist rule opened with a crash programme of smallpox vaccination in 1949-52 ... [additionally] the Patriotic Hygiene Campaign sought to cleanse the environment by cleaning up towns and cities, managing refuse and waste in urban and rural areas, and reducing breeding and feeding opportunities for disease vectors, especially rats, snails, lice, houseflies, and mosquitoes. State authorities pushed latrine building, alerted people to the role of human faeces in disease propagation ... and in general followed a household approach to sanitation.
2. ... the campaign asked people to learn how to protect themselves against disease, using continuous social pressure to induce changes in individual behaviour and attitudes towards personal hygiene, environmental sanitation, and nutrition.
3. ... the Chinese, copying the Soviets, began a massive programme to train physicians and medical aids and to build hospitals and clinics.[12]

Much of the improved health was the result of the introduction of a cadre of "barefoot doctors":

> Thousands of peasants – men and women who were mostly in their 20s and already had some general education – were selected for an intensive three-to-six month course in medical training. They were instructed in anatomy, bacteriology, diagnosing disease, acupuncture, prescribing traditional and Western medicine, birth control and maternal and infant care ... The barefoot doctors continued their farming work in the commune fields, working alongside their comrades. Their proximity also made them readily available to help those in need. They provided basic health care: first immunizations against disease such as diphtheria, whooping cough and measles, and health education. They taught hygiene and basic as hand washing before eating and after using latrines. Illnesses beyond their training the barefoot doctors referred to physicians at commune health centres ... there were an estimated 1 million barefoot doctors in China.[13]

Before these developments "large numbers of people had died prematurely from malaria, tuberculosis, and faecal disease ... The methods of controlling them came to be understood through medical and public health research in Western countries and partly through what Western public health experts learned while working in Latin America, the Caribbean, and Asia."[14]

These health improvements occurred in spite of China's real income per head only being a fraction of that in the United Kingdom, even after a period of significant growth between 1970 and 2016.

---

[9] World Bank China Data Online

[10] M. Bergaglio, 'Population Growth in China: the Basic Characteristics of China's Demographic Transition' CiteSeer Online.2001.

[11] World Bank China Data Online

[12] Riley, op. cit., pp. 110, 111.

[13] V. Valentine, *Health for the Masses: China's 'Barefoot' Doctors*, NPR Online, 2006, p. 2.

[14] Riley, op. cit., p. 169.

Table 3: GNI per Capita (U.S.A. Dollars) in China and the United Kingdom, 1970 and 2016.[15]

Year	China	United Kingdom
1970	120	2,430
2016	8,260	42,390

The reduction in mortality and the growth of population resulted in a large surplus of cheap labour, allowing it to develop a highly competitive manufacturing export industry, gradually eroding the manufacturing industries of Britain, Europe and the United States. As Nicholas Comfort has concluded, "Over the decades that followed [from 1989 onwards] China, whose Communist Party had approved the opening up of the economy as far back as 1978, would embrace a rampant capitalism ... that would in turn generate an export-led boom giving it a near-stranglehold over the global economy."[16]

The import of manufactured goods from Asia and China into the United Kingdom in 2016 is as follows:

Table 4: The Country of Origin of Imports of Selected Commodities into the United Kingdom, 2016.[17]

Imported Commodity	Asia & Oceania, Responsible for Proportion Of Total Imports	China, Responsible for Proportion Of Total Imports
Headgear	84.6%	71.3%
Ships & Boats	77.0%	10.6%
Toys & Games	69.1%	61.4%
Textiles	55.4%	51.9%
Footwear	53.2%	30.1%
Tools, Implements & Cutlery	40.7%	28.2%
Electrical Machinery	36.5%	23.3%
Furniture	30.9%	15.1%
Ceramics	28.0%	20.5%
Iron & Steel Products	21.4%	13.1%

The scale of exports coming from Asian countries – particularly from China – has had a major impact on Britain's economy and society. Manufacturing as a proportion of all employment in the United Kingdom fell from 22% in 1982 to 15% in 1992 and 8% in 2015.[18] In China and elsewhere, labour surpluses have been exploited for the maximisation of profit, transferring industrial production from developed to developing countries, with an increasing reliance on services in the developed world. The impact of these changes on the UK's economy has been summarized as follows:

> The UK's manufacturing sector has shrunk by two-thirds in the three decades between 1980 and 2010. Whereas a million people made cars in the UK during the 1960s, but by 2009 that number was just 180,000 ... by the 1980s the cotton industry had vanished. In 1983 there were 170 working coal mines, but by 2009, there were 4. After World War 2, manufacturing accounted for almost 40% of UK's

[15] World Bank China Data Online

[16] N. Comfort, *The Slow Death of British Industry*, 2012, p. 170.

[17] uktradeinfo@hmrc.gsi.gov.uk

[18] Manufacturing Statistics, 2015, Online.

economy. Manufacturing is now just a tenth of the UK economy ... and the service industry is now 75.8%.[19]

These changes have resulted in increases in the amount of socio-economic inequality. *The Economist* recently observed: "When countries with lots of low-wage workers begin trading with richer economies, pay for similarly skilled workers converges. Those in poor countries grow richer while in richer countries workers get poorer."[20] This process has a particular impact on the different regions of the wealthier countries, creating poverty in the old industrial communities but increased wealth in regions specializing in services. An example of this is to be found in patterns of household expenditure and property prices in different regions in England & Wales.

Table 5: Regional Gross Disposable Household Income and Property Prices in England & Wales.[21]

Region	Manufacturing As A Proportion Of All Jobs, 1991	Manufacturing As A Proportion Of All Jobs, 2015	Gross Disposable Annual Income Per Head, 2014 (£)	Average House Price, March 2017 (£)
West Midlands	30%	11%	15,611	180,293
East Midlands	30%	12%	16,217	176,213
Yorkshire & Humber	25%	11%	15,498	149,606
North West	25%	9%	15,776	150,250
North East	24%	9%	15,189	122,298
Wales	23%	10%	15,302	147,746
East	22%	8%	18,897	277,127
South West	19%	8%	18,144	240,222
South East	17%	6%	20,434	311,514
London	11%	2%	23,607	471,742

Although not a perfect correlation, the northern regions with the greatest historical reductions in the amount of manufacturing industry have lower household incomes and property values than elsewhere. The changing regional pattern of the social structure in the twentieth century has been documented by Gregory, Dorling and Southall:

> The data [on the regional proportion of Social Class V] for 1911 present an intriguing pattern: the highest values were in London and particularly the East End; almost all of Southern England had higher rates than the Midlands or the North. [The data on regional changes] ... shows areas in the rural south in particular as having improved significantly since before the First World War, while Wales, the West Midlands, western parts of Norfolk, Nottinghamshire, Derbyshire, and southern Yorkshire, and what are now County Durham and West Cumbria have got worse. This arguably reflects major changes in the industrial bases of different areas, the northern areas losing the staple industries which employed large numbers of skilled and semi-skilled workers ... while rural southern areas were colonized by white-collar commuters. The inequality ratio for Social Class V tells a broadly similar story to our other measures of [inequality, including infant mortality].[22]

[19] A. Taylor, '21 Sad Facts about Deindustrialization of Britain' *Business Insider,* 18th November 2011.
[20] *The Economist*. 21st October 2017, p. 20.
[21] GovUk Online*,* 2017.
[22] Gregory, Dorling and Southall 2001p. 307

In the nineteenth century incomes were higher in the industrial regions of the north of England,[23] a pattern reversed in the twentieth century.

The impact of the process of de-industrialization has been summarized by Aditya Chakrabortty in 2011 as follows:

> Before moving to Yale and becoming a bestselling historian, Paul Kennedy grew up on Tyneside in the 50s and 60s. "A world of great noise and much dirt," is how he remembers it, where the chief industry was building ships and his father and uncles were boilermakers in Wallsend. Last year the academic gave a lecture that reminisced a little about those days. "There was a deep satisfaction about making things," he said. "A deep satisfaction among all of those that had supplied the services, whether it was the local bankers with credit; whether it was the local design firms. When a ship was launched at [the Newcastle firm] Swan Hunter all the kids at the local school went to see the thing our fathers had put together ...Wandering around Wallsend a couple of weeks ago, I didn't spot any ships being launched, or even built. The giant yard Kennedy mentioned, Swan Hunter, shut a few years back, leaving acres of muddy wasteland that still haven't lured a buyer. You still find industrial estates, of course ... The biggest unit on one estate is a dry cleaner; on another, a warehouse for loft insulation dwarfs all else. At a rare actual manufacturing firm, the director, Tom Clark, takes me out to the edge of the Tyne, centre of the industrial excitement remembered by Kennedy. "Get past us and there's nothing actually being made for miles," he says, and points down the still waterfront. At his firm, Pearson Engineering, Clark introduces me to a plater called Billy Day. Now 51, he began at the firm at 16. His 23-year-old son William is still out of work, despite applying to dozens of small factories. As the local industry's gone, so too have the apprenticeships and jobs. "No wonder you get young kids hanging out doing whatever," says Day. "We've lost a whole generation." You can see similar estates and hear similar tales across the country, from the north-west down to the Midlands and the old industrial parts of suburban London. But it's in the north-east, the former home of coal, steel, ships and not a lot else, that you see this unyielding decline at its most concentrated. It's a process I've come to think of as the de-industrial revolution, in which previously productive regions and classes are cast adrift."[24]

These conditions have had political consequences, summarized by *The Economist*: "Votes for Brexit and for Mr Trump were often cast as an expression of anger at a system that seems rigged. Unless policymakers grapple seriously with the problem of regional inequality, the fury of those voters will only increase."[25] These problems are unlikely to diminish in the short-run, but a part of the long-run solution will only occur if falling fertility in developing counties reduces population increases to levels found currently in the developed world. This is likely to happen according to demographic transition theory,[26] although this raises speculative issues beyond the scope of the present paper.

---

[23] B. R. Mitchell and P. Deane, *Abstract of British Historical Statistics*, 1971, pp. 346, 347; E.H. Hunt, 'Industrialization and Regional Inequality in Britain, 1760-1914' *The Journal of Economic History*, 49, 1986, pp. 935-966; M. Penn, *Manchester Fourteen Miles*, 1979, pp. xvii, xviii.

[24] *The Guardian*: 15th November, 2011.

[25] *The Economist*, October 21st, 2017, p. 24

[26] Harper, op. cit., 2016.

English Population Growth in the Eighteenth Century

By Peter Razzell

Abstract

This paper presents a new version of England's eighteenth century population history. Evidence is produced to show that mortality rather than fertility was the main engine of population growth during this period. Adult mortality approximately halved from the beginning to the end of the century, with reductions occurring amongst all socio-economic groups and in all areas of the country. Infant and child mortality fell at a later date from the middle of the eighteenth century onwards, reducing first amongst the wealthy.

New evidence suggests that nearly all women were married in the seventeenth century, contradicting Hajnal's theoretical notion of a European marriage pattern. The proportion of married women reduced during the eighteenth century in all age groups, particularly amongst the wealthy and literate, resulting partly from a major increase in female literacy. This was counter-balanced by a decrease in the mean age at marriage amongst the poor, compared to an increasing age of marriage amongst the wealthy. The net effect of these developments was the stabilisation of fertility levels.

It is argued that the reduction in mortality was largely independent of economic growth. The fall in mortality probably resulted from an autonomous reduction in disease virulence, along with a number of medical innovations and an improvement in personal and public hygiene. The result of growing population was an increase in a surplus of labour, contributing to the development of capitalism and the growth of the English economy.

I - INTRODUCTION

Malthus is the most important influence on thinking about the relationship between economic and demographic development. In his theoretical work, he emphasized the impact of economic factors on fertility and population levels, through shifts in the incidence of marriage. He had been influenced by Adam Smith, who had argued that 'the demand for men, like that for any other commodity, necessarily regulates the production of men; quickens it when it goes on too slowly, and stops it when it advances too fast.'[1] Malthus's work in turn influenced Ricardo, Marx, Marshall and other classical economists, who all assumed the primacy of economics over demography. The exception was Keynes, who accepted that population affected levels of aggregate demand – he was a strong admirer of Malthus – but had little or nothing to say about the impact of population growth on the supply side, in particular the supply of labour.[2]

Malthus's writings reflected the anxieties of his contemporaries in their concern to prevent a decline in their standard of living and economic privileges. His "preventative" method applied particularly to the middle and upper classes, whereas the "positive" checks were mainly applicable to the poor. Malthus's theory of population stressed the economic basis of marriage and fertility, with a growth in income leading to earlier marriage and a rise in fertility. However, there was a contradiction between his theoretical arguments and his empirical analysis of

[1] Smith (1976), p. 98. Smith emphasized the impact of poverty on mortality.

[2] Keynes (2010); Keynes (2012).

England's population history. In the latter he emphasized the role of mortality rather than fertility in shaping changes in population levels:

> *It would appear, by the present proportion of marriages, that the more rapid increase of population, supposed to have taken place since the year 1780, has arisen more from the diminution of deaths than the increase of the births.*[3]

He elsewhere amplified this summary statement:

> *... there is good reason to believe that not only in London, but other towns in England, and probably also country villages, were at this time [the 1760s] ... less healthy than at present. Dr William Heberden remarks that the registers of the ten years from 1759 to 1768, from which Dr Price calculated the probabilities of life in London, indicate a much greater degree of unhealthiness than the registers of late years. And the returns pursuant to the Population Act [of 1801], even allowing for great omissions in the burials, exhibit in all our provincial towns, and in the country, a degree of healthiness much greater than had before calculated ...The returns of the Population Act in 1811 ... showed ... a greatly improved healthiness of the people, notwithstanding the increase of the towns and the increased proportion of the population engaged in manufacturing employments.*[4]

He argued that falling mortality had led to a reduction in the incidence of marriage:

> *... the gradual diminution and almost total extinction of the plagues which so frequently visited Europe, in the seventeenth and the beginning of the eighteenth centuries, produced a change [in the incidence of marriage] ... in this country [England] it is not to be doubted that the proportion of marriages has become smaller since the improvement of our towns, the less frequent return of epidemics, and the adoption of habits of greater cleanliness.*[5]

He concluded that disease environment played a critical role in shaping mortality levels: 'A married pair with the best constitution, who lead the most regular and quiet life, seldom find that their children enjoy the same health in town as in the country'[6]

Malthus in his empirical writings gave a sociological rather than an economic analysis of marriage: 'It is not … among the higher ranks of society, that we have most reason to apprehend the too great frequency of marriage … [it is] squalid poverty ... [which] prompt universally to early marriage ...'[7] He argued that the 'carelessness and want of frugality' so prevalent among the poor, was 'contrary to the disposition generally to be remarked among petty tradesmen and small farmers,'[8] and that

[3] Malthus (1803), p. 311.
[4] Malthus (1989), Vol. 1, pp. 256, 267.
[5] Malthus (1989), Vol. 2, p. 198. See also Malthus (1989), Vol. 1, p.193 and Vol. 2, p.115.
[6] Malthus (1989), Vol. 1, p. 257.
[7] Malthus (1989), Vol. 1, p. 439; Vol. 2, pp. 114, 150.
[8] Malthus (1989), Vol. 1, p. 359.

> *poverty itself, which appears to be the great spur to industry, when it has once passed certain limits, almost ceases to operate. The indigence which is hopeless destroys all vigorous exertion ... It is the hope of bettering our condition, and the fear of want, rather than want itself, that is the best stimulus to industry, and its' most constant and best directed efforts will almost invariably be found among a class of people above the class of the wretchedly poor.*[9]

It was this emphasis on 'bettering our condition' that led Malthus to stress education as the best way of encouraging the postponement of marriage:

> *... to better the condition of the lower classes of society, our object should be to ... [cultivate] a spirit of independence, a decent pride, and a taste for cleanliness and comfort among the poor. These habits would be best inculcated by a system of general education and, when strongly fixed, would be the most powerful means of preventing their marrying ... [and] consequently raise them nearer to the middle classes of society.*[10]

Malthus is expressing here the insight which has informed much of the literature on modern birth control practices: that education − particularly of women − combined with economic opportunity, is the most powerful way of encouraging fertility reduction.

II – THE RELIABILITY OF PARISH REGISTERS

There is an element of uncertainty in all historical demographic measures, including local and regional variations. In order to address these issues, a methodology involving the triangulation of data has been adopted in this paper. This allows independent checking of all findings, important where these findings are unexpected and potentially controversial. An example of this is the finding that virtually all women were married in England during the seventeenth century, contradicting the theoretical notion of a European marriage pattern.[11] This conclusion was reached by using five different sources – censuses, church court depositions, burial registers, wills and family genealogies.[12] Likewise, the finding of the halving of adult mortality in the eighteenth century is based on the analysis of apprenticeship indentures, marriage registers, family genealogies, and data on elite groups such as Members of Parliament.[13]

The same methodological principle applies to the measurement of parish register reliability. Central to all discussion of population history before the introduction of civil registration in 1837 is the reliability of parish registers. Nine objective methods measuring burial register reliability are available, involving the triangulation of data.[14] The most important two methods are: (i) the same-name technique and (ii) the comparison of individual entries in probate and burial registers.

The same-name technique is based on a custom in England which gave the name of a dead child to a subsequent child of the same sex. Evidence from local censuses and other listings suggests that

[9] Ibid, p. 439.
[10] Malthus (1989), Vol. 2, p. 155.
[11] Hajnal (1965), p. 101.
[12] Razzell (2016), pp. 60-70.
[13] Ibid, pp. 45-56.
[14] Ibid, 15, 16.

there were no living children with the same names in individual families in the period 1676-1849.[15] However, according to probate data for different parts of England during the period 1600-1649 there were thirteen living same-name children out of a total of 2,144 – 0.6 per cent – although some of these children may have been step-siblings.[16]

Where two children of the same family were baptised with an identical name, it is therefore possible to measure the completeness of burial registration by searching for the first same-name child in the burial register. The technique can only be applied to families with at least two recorded baptisms of children of the same sex, but it is a valuable method of assessing the quality of burial registration.

The most important work on England's demographic history using parish registers is that carried out by E.A Wrigley and colleagues of the Cambridge Group. Their main findings were that after a period of stagnation in the second half of the seventeenth and first half of the eighteenth century, population began to grow rapidly after the middle of the eighteenth century, with about two-thirds of the population increase due to a rise in fertility, and one third to decreasing mortality.[17] They have argued that the growth of population was mainly the result of the increase in fertility associated with a fall in the age of marriage, which in turn was due to growing real incomes lagged over time, a conclusion largely confirming the theoretical work of Malthus.

Because of deficiencies in parish registration, it was necessary to inflate the number of burials, baptisms, and marriages in order to establish reliable measures of deaths, births, and marriages. During the period in which the Cambridge Group's research was carried out there were no methods available to independently measure the reliability of inflation ratios. This was recognized by Wrigley et.al. when they concluded that 'the lack of a reliable alternative data source makes it impossible … to test effectively the completeness of Anglican registration', resulting in 'arbitrary' inflation ratios which can only be based on 'internal plausibility and internal consistency of the results obtained.'[18]

However there are now available new objective methods of measuring parish register reliability. The following table summarizes a same-name analysis of 15 Cambridge Group reconstitution parishes during the period 1650-1837.

Table 1: Proportion of untraced same-name cases in 15 Cambridge Group reconstitution parishes, 1650-1837

Period	Total Number of Same-Name Cases	Number of Same-Name Cases Traced in Burial Registers	Proportion of Untraced Cases
1650-99	1,160	873	24.7%
1700-49	1,533	1,246	18.7%
1750-99	1,227	903	26.4%
1800-37	907	705	22.3%

[15] Galley, Garrett, Davies and Reid initially argued that there were some living same-name English children enumerated in the 1695 Marriage Duty Census, but subsequently conceded that these same-name siblings were a consequence of transcription errors. Galley, Garrett, Davies and Reid (2012), p.82. See also Galley, Garrett, Davies and Reid (2011a); Razzell (2011); Razzell (2012). Galley et.al successfully established that there were some living same-name children in Highland Scotland at this time, but all the research reviewed in this paper relates to English demographic experience.

[16] See Razzell (2011), p. 67 for a list of the places and dates involved.

[17] Wrigley, Davies, Oeppen and Schofield (1997), p. 126.

[18] Wrigley and Schofield (1989), p. 137; Wrigley, Davies, Oeppen and Schofield (1997), pp. 91-92.

There appears to have been a slight improvement in burial registration reliability in the first half of the eighteenth century, although other data suggests no significant change in the period between 1650 and 1837.[19]

Research comparing probate with burial register data covering 147 parishes indicates that there were no significant changes in burial registration reliability in the parish register period.[20] The most detailed research available is on the county of Bedfordshire, where a study of all 124 parishes has been carried out.[21]

Table 2: Proportion of probate cases traced in 124 Bedfordshire burial registers, 1543-1849.[22]

Period of probate	Total number of probate cases	Proportion of burials untraced
1543-99	610	26%
1600-49	3731	21%
1650-99	4626	26%
1700-49	6030	23%
1750-99	3744	22%
1800-49	3303	27%
Total	22044	24%

Wrigley & Schofield had assumed in their aggregative research that other than defective periods, burial registration was perfect in the period leading up to the middle of the seventeenth century and only deteriorated significantly at the end of the eighteenth century.[23] This is reflected in the inflation ratios they used to translate burials into deaths which were as follows: 1540-99: 0%; 1600-49: 0%; 1650-99: 1.9%; 1700-49: 4.6%; 1750-99: 10.0%: 1800-39: 25.8%.[24] Data on same-name and probate/burial register research, indicates that approximately 25% of all burials were missing from parish registers in the period 1600-1837, with no clear linear trends in register reliability over time.

The absence of significant changes in burial register reliability is similar to the findings of research on baptism register reliability. This involved research comparing information in censuses and baptism registers, including an evaluation of the quality of the census data through cross-matching censuses at different dates.[25] There was no linear trend found in the eighteenth century, with about 30 per cent of all births missing from the baptisms registers.[26]

Wrigley and Schofield's inflation ratios for baptisms in the period 1710-1836 are as follows: 1710-42: 11.5%; 1743-62: 13.9%; 1763-80: 16.4%; 1781-1800: 26.0%; 1801-20: 42.9%; 1821-36: 39.1%.[27] They assumed that birth under-registration was relatively low in the period 1710-80, but deteriorated sharply from the 1780s onwards, particularly after 1801. This assumed pattern is at

[19] Razzell (2016), pp. 18-23.
[20] Probate data tends to exclude the poorest members of a community, but data for Bedfordshire suggests that the poorest occupational group – labourers – experienced similar levels of burial under-registration as the rest of the population. Razzell, Spence and Woollard (2010), p. 45.
[21] Ibid.
[22] Ibid, p. 42.
[23] Wrigley and Schofield, (1989), p. 561.
[24] Ibid, p. 561.
[25] Razzell (1994), pp. 84-89.
[26] Razzell (2016), pp. 22, 23.
[27] Wrigley and Schofield (1989), pp. 541-44.

variance with the findings outlined above, which essentially show no major changes in the eighteenth and early nineteenth century.

There is also evidence of a high level of marriage under-registration which is confirmed by Baker in his study of eighteenth century Cardington in Bedfordshire. He with colleagues attempted to trace both native and other adults who had migrated from all parts of the county, and found that 40.1% of baptisms, 31.5% of marriages and 24.9% of burials could not be traced in parish registers.[28] According to a range of evidence, this non-registration of births, marriages and deaths was mainly due to the negligence of clergyman and clerks in compiling parish registers.[29]

Wrigley and colleagues attempted to address the problems of parish register reliability by constructing a complex mathematical back projection model. The model suffers from a range of arbitrary assumptions, including the sharp inflation of baptisms and burials at the end of the eighteenth and beginning of the nineteenth century. Additionally, these models are very sensitive to changes in assumption. For example, as a part of their back projection programme, Wrigley and Schofield reduced the size of the age group 90-94 enumerated in the 1871 Census by 44%; if they had chosen instead to reduce this by 40%, their estimate of the English population in 1541 would have been 9% larger.[30]

III – ESTIMATES OF POPULATION GROWTH

Given that there were no major changes in parish register reliability in the parish register period, the most valuable data created by the Cambridge Group are the raw uncorrected national figures of baptisms, marriages and burials. These raw national figures provide the basis for the calculation of population changes in the eighteenth century, but with the assumption of zero net migration. Approximately 30% of baptisms and 25% of burials went unregistered in the eighteenth century,[31] and applying these correction ratios to the raw national figures yields the following population figures.

[28] Baker (1973), p. 18.
[29] Razzell (1994), pp. 108-111.
[30] Lee and Lam (1983), p. 446.
[31] These proportions are based on figures discussed previously, but rounded for purposes of analysis. Twenty-two per cent of same-name cases in the Cambridge Group and rural parish samples were untraced in the period 1650-1837, but the number of untraced cases in urban areas appears to have been higher. For example the proportion of untraced cases in London and Liverpool in the period 1700-49 was significantly higher than elsewhere in the parish register period. Razzell (2007), pp.134, 138.

Table 3: Estimated population sizes of England, 1695-1801.[32]

Period	Baptisms x 130/00	Burials x 125/100	Estimated births minus estimated deaths	Population Size
				1695: 4,632,0000 (Glass)[33]
1695-99	950392	856190	94202	1699: 4,726,202
1700-09	1939220	1656696	282524	1709: 5,008,726
1710-19	1919766	1730584	189182	1719: 5,197,908
1720-29	1924209	2114755	-190546	1729: 5,007,362
1730-39	2217874	1884734	333140	1739: 5,340,502
1740-49	2129258	1936279	192979	1749: 5,533,481
1750-59	2249703	1799673	450030	1759: 5,983,511
1760-69	2407096	2052756	354340	1769: 6,337,851
1770-79	2679378	2023006	656372	1779: 7,008,408
1780-89	2848378	2230761	617617	1789: 7,626,025
1790-99	3151233	2219859	931374	1799: 8,557,399
1800-01	585113	475775	109338	1801: 8,666,737
				From National Censuses: [34]
				1801: 8.561,000
				1811: 9,476,700
				1821: 11,198,604

The start date of 1695 has been used because it is partly based on the marriage duty census of that year, and the end date of 1801 because it is the year of the first national census. The estimated population figure for 1801 – 8,666,737 – is slightly greater than the figure that Rickman calculated for 1801 – 8.561 million.[35] However, there have been a number of different estimates of population sizes for the years 1695 and 1801, and the figures in Table 3 are within the range of these different estimates.[36]

Table 3 indicates that population diminished in the 1720s but increased gradually after that period, accelerating rapidly at the end of the eighteenth and beginning of the nineteenth century. The raw data suggests that it was a fall in mortality rather than a rise in fertility that was responsible for the increase in population.

[32] For the raw national figures see Wrigley and Schofield (1989), pp. 537-552, column 5.
[33] Ibid, p. 571.
[34] Ibid, pp, 577, 588.
[35] Ibid, p. 571.
[36] Glass and Eversley (1965), p. 240.

Table 4: English baptism and burial rates (Per 1000) in England calculated from Cambridge Group data.[37]

Period	Estimated population	Baptism rate	Burial rate
1701-40	5,160,000 (1721)	30.4	28.7
1741-80	6,054,000 (1761)	30.3	25.9
1781-1820	8,667,000 (1801)	29.4	20.6

It is only because Wrigley & Schofield disproportionately inflated the number of baptisms in the period 1781-1820 that they concluded that there was a rise in the crude baptism rate in this period, and yet as we have seen the direct evidence on baptism registration reliability suggests that there were no significant changes in this period.[38] Gregory King's work on the age structure of the English population in 1695 indicates it was very similar to that in 1821 based on national enumeration returns,[39] suggesting that there was no long-term change in age-specific fertility during this period.

Table 4 indicates that it was falling mortality that fuelled population growth, but in order to further clarify the exact demographic changes in the eighteenth century, it is necessary to consider in detail the empirical evidence on mortality, nuptiality and fertility in the parish register period.

IV – THE HISTORY OF INFANT AND CHILD MORTALITY

Most studies of infant and child mortality have suffered from the lack of an objective method of measuring burial registration reliability.[40] The same-name method allows objective measurement, stating its procedures in advance and not making adjustments to resulting findings. I have used the technique for the analysis of 11 Cambridge reconstitution parishes, as well as in 15 rural parishes from other areas of England.

[37] The figures of baptisms and burials were those listed in Wrigley and Schofield (1989), pp. 541-544, 549-552. The population estimates are derived from those in Table 3.

[38] Inflating the baptism rate in 1781-1820 by thirty per cent indicates that the crude birth rate was 38.2 per 1,000. The birth rate during the early period of civil registration - allowing for birth under-registration - was of the order of 36.5 per 1,000, slightly less than the estimated figure for 1781-1820. See Razzell (1994), p. 137; Mitchell and Deane (1971), p. 79.

[39] Glass and Eversley (1965), p. 215.

[40] There are a number of historical studies of infant and child mortality which suffer from this difficulty. See Jones (1980); Landers (1991); Houston (1992); Huck, (1994); Dobson (1997); Galley (1998).

Table 5: Infant and child (1-4) mortality in 11 Cambridge Group and 15 rural parishes, 1700-1837.[41]

Period	Number of infants at risk	Number of children at risk	IMR	CMR
11 Cambridge Group parishes				
1700-49	11933	8842	174/1000	110/1000
1750-99	12591	9897	148/1000	97/1000
1800-37	15362	9230	110/1000	99/1000
15 rural parishes				
1700-49	8332	5603	182/1000	128/1000
1750-99	9629	6950	150/1000	126/1000
1800-37	9375	6183	94/1000	81/1000

The pattern of mortality in the two samples is similar, although the reductions in mortality between 1700-49 and 1800-37 are greater in the rural areas than in the Cambridge Group sample. This may be partly a function of population size, as the mean population in 1801 of the Cambridge Group parishes was 1,349 and that of the rural sample 589. The average national mean size of the English population in 1801 was about 860,[42] and so the rural parishes are slightly more representative than the Cambridge Group ones.

From research on birth-baptism intervals and infant mortality, it is estimated that a maximum of 5% of children died before baptism in the period 1761-1834. However, many 'sickly' children were privately baptised, reducing mortality before baptism.[43] The infant mortality rates in both samples in 1800-37 were relatively low – 110/1000 and 94/1000 – and this may be partly a function of the exclusion of infants dying before baptism. However, Woods estimated that the infant mortality rate in rural areas during the Victorian period was 97 per 1,000 as against 218 per 1,000 in urban areas, with a national average of 150 per 1,000.[44] Woods calculated the rural rate from data for Dorset, Hertfordshire and Wiltshire, southern counties like those forming the basis of the samples in Table 5. Similar consideration are likely to apply to child mortality rates, for although the child mortality rate for the age group 1-4 nationally in 1838-54 was 134 per 1,000,[45] it is likely to have been significantly less of that in rural areas, similar to that depicted in Table 5.

However, the sample sizes are small and are not necessarily representative of the whole country. They do not include any northern parishes or large towns, and under-represent industrial villages.[46] Infant and child mortality was much higher in large towns than in rural and provincial

[41] The 11 Cambridge Group parishes are: Alcester; Aldenham; Austrey; Banbury; Bottesford; Colyton; Dawlish; Great Oakley; Ippleden; Morchard Bishop. The 15 rural parishes are: Ackworth; Ampthill; Arrington; Barton-in-the-Clay; Beeley; Breamore; Canewden; Cusop; Eaton Hastings; Kemerton; Sandy; Stow Maries; Truro; Weston Colville; Woodchurch; Youlgreave.

[42] Wrigley et.al. (1997), p. 20.

[43] Razzell (1994), pp. 106, 107.

[44] Woods (2000), pp. 260, 261.

[45] Registrar-General Supplement, p. v.

[46] A reconstitution study of Ackworth in Yorkshire for the period 1687-1812 indicates that the pattern of infant and child mortality was similar to that in Table 5, although at a somewhat lower level. The figures are as follows: 1687-1749: IMR: 166, CMR: 114; 1750-1812: IMR: 82, CMR: 77. Razzell (2016), p.34.

parishes in the seventeenth and eighteenth centuries. The infant and child mortality rates in 18 rural reconstitution parishes in 1650-1699 were 151/1000 and 106/1000 respectively; the equivalent rates in London, Norwich, Ipswich and Canterbury in a similar period were 304/1000 and 237/1000. [47] Urban infant and child mortality was twice of that in rural and provincial parishes in the late seventeenth century, but by the nineteenth century the average infant mortality rate in these urban areas had reduced to 179 per 1000.[48] However, there is some evidence to indicate that infant mortality grew in some urban and industrial parishes in the first half of the nineteenth century,[49] although the scale of reductions during the eighteenth century in the four urban parishes greatly outweighed the relatively modest increases in urban areas in the nineteenth century.

The pattern of infant and child mortality in the most important urban area – London – is indicated by the results of reconstitution studies of 16 City of London parishes in the period 1539-1849.

Table 6: Infant and child (1-4) mortality (per 1000) in 16 London parishes, 1650-1849.[50]

Period	IMR	CMR	
1650-99	256	282	
1700-49	409	176	
1750-99	263	270	
1800-49	141	118	

Infant mortality increased significantly between 1650-99 and 1700-49, before falling very sharply after the middle of the eighteenth century. There was a similar pattern in child mortality, except for the rise in mortality in the second half of the eighteenth century.

V – SOCIO-ECONMIC STATUS AND INFANT AND CHILD MORTALITY

One further way of exploring the factors shaping infant and child mortality is to analyse the relationship between socio-economic status and mortality.

Table 7: Infant and child (1-4) mortality (per 1,000) amongst elite and control families in 17 Cambridge Group parishes, 1650-1799.[51]

Period	Elite families		Control Families	
	IMR	CMR	IMR	CMR
1650-99	158	143	180	132
1700-49	177	106	223	146
1750-99	113	69	159	134

[47] Ibid.
[48] Ibid. The Northampton Bills of Mortality indicate that child mortality under the age of two did not fall until the 1780s onwards. Ibid, p.36.
[49] See Armstrong (1981); Huck (1994); Szreter and Mooney (1998).
[50] Razzell (2007), pp. 13, 134.
[51] Razzell (2016), p. 37.

An elite family – gentlemen, professionals and merchants – was matched with the next control family in the baptism register, most of whom were artisans and labourers. There was little difference between the two groups in the late seventeenth century, but a sharp divergence thereafter, particularly in child mortality rates. Other sources indicate a variation in findings, although overall it would appear that these forms of early mortality reduced first amongst wealthy families and only later amongst the general population in the eighteenth century.[52] Lower infant and child mortality levels amongst the wealthy continued throughout the nineteenth century,[53] although at significantly reduced levels than in the seventeenth century. However, areas with different socio-economic profiles showed if everything a reverse pattern. This can be illustrated with reference to London, where the Registrar-General provided data on mortality by registration sub-district. He classified districts by poverty levels as measured by average rateable value.

Table 8: Infant, child and adult mortality in London by rateable value of registration district, 1839-44.[54]

Registration districts	Mean annual value of rated property	IMR	CMR	Adult (25-44) male mortality per 1000
10 districts with lowest rateable value	£15	153	52	13
10 districts with medium rateable value	£26	168	59	15
10 districts with highest rateable value	£58	167	58	13

Most of the poor districts were in the East End of London, and the wealthy ones in the West End.[55] The lack of an association between socio-economic status and infant mortality is supported by evidence on Quakers, who by the nineteenth century were mainly wealthy merchants and professionals. The infant mortality rate amongst Quakers in London in 1825-49 was 150 per 1000, similar to the rate amongst the total population in equivalent registration districts in 1838-44.[56]

These surprising findings are replicated in other districts of England. In the period 1851-60, mortality levels in the wealthy towns of Bath, Cheltenham, Richmond and Brighton were significantly higher than in poorer districts in the same county.[57] The wealthy areas were towns,

[52] Razzell, (2007), pp. 91, 103-105, 111, 112, 133; Razzell (2016), pp. 37-41.
[53] Razzell (2007), pp. 202-204.
[54] Ibid, p. 136.
[55] Ibid.
[56] See Ibid, p. 137 and Landers (1991).
[57] Razzell (2016), p. 41.

and the poorer areas rural districts, indicating that disease environment was more important in these instances than poverty in shaping mortality levels.[58]

To summarize, in rural and provincial areas infant mortally fell sharply between the first half of the eighteenth and nineteenth centuries, nearly halving in some areas. Child mortality in these districts was more stable, although there appears to have been a significant fall in some rural areas at the beginning of the nineteenth century. In London and in other urban districts there were marked falls in both infant and child mortality. Child mortality amongst the wealthy reduced in rural and provincial areas at an earlier period – from the beginning of the eighteenth century onwards – than it did among the general population.

It is less clear what the influence of socio-economic status was on urban infant and child mortality, and in London by the mid-nineteenth century there appears to have been little or no association between poverty and these forms of mortality. Also, as we have seen, in a number of provincial districts mortality was significantly lower in poor than in wealthy areas in the 1850s.

The general timing and extent of reductions in early childhood mortality cannot fully explain the scale of population increase in the eighteenth century. For a full explanation of this surge in population growth we must look elsewhere.

VI – THE HISTORY OF ADULT MORTALITY

There are a number of problems with the reconstitution study of adult mortality, in particular the unreliability of raw burial registration data. Only about ten per cent of the original sample can be included the analysis, which is not likely to be socially or demographically representative of the total population.[59] There is also the difficulty of establishing accurate nominal record linkages between baptisms/marriages and subsequent burials, as most parish registers only list the names of people buried without further identifying information. There are however a number of sources which allow the direct measurement of adult mortality, the most important of which are: i. apprenticeship indenture records, and ii. marriage licences.

In the year 1710 the government introduced a national tax on apprenticeship indentures – the Inland Revenue Register (INR Register) – which was in existence until the early nineteenth century. Details of these indentures have survived and are currently being digitised by the Society of Genealogists.[60] The indentures in the early period provide the following information on fathers: name, place of residence, occupation, and whether or not they were alive or dead. Additionally the name of the apprentice was recorded along with the amount paid for the indenture.

A sample of 1,578 cases was selected from the national register, and data on the mortality status of fathers was established. It is estimated that a minimal annual mortality rate for England in 1710-13 was 20.9 per 1,000, which can be compared to figures published by the Registrar-General for a similar age group – 25-44 – in the period 1838-42 – 11 per 1000.[61] This indicates

[58] See Woods (2000), pp. 170-202 for an analysis of the mortality differences between urban and rural districts in this period.

[59] Razzell (2016), p. 43.

[60] I would like to thank the Society of Genealogists for making available the digital version of the INR Register, covering the surnames beginning with the letters A to M.

[61] Mitchell and Deane (1971), p 38.

that male adult mortality approximately halved in the period between the early eighteenth and middle of the nineteenth century, a conclusion borne out by a number of other sources.[62]
Marriage licences are one of the most informative sources, covering between 30 and 90 per cent of the population.[63] For children under the age of 21, they required parental permission, and where a father was dead, permission of a widowed mother or guardian was required. The licences are available from the beginning of the seventeenth to the end of the eighteenth century, and an analysis of available licences yields the following results:

Table 9: Fathers of spinsters under twenty-one: proportions dead in English regions, 1600-1799.

Period of Marriage	*London*	*South of England*	*East Kent Diocese*	*Durham Diocese*
1600-46	46%	40%	47%	-
1661-99	47%	44%	43%	-
1700-09	48%	47%	50%	-
1710-19	47%	44%	48%	-
1720-29	45%	39%	48%	-
1730-39	46%	39%	34%	-
1740-49	55%	45%	37%	42%
1750-59	40%	41%	27%	28%
1760-69	35%	35%	22%	27%
1770-79	39%	31%	24%	29%
1780-89	31%	32%	28%	25%
1790-99	31%	27%	22%	-

According to this table, male adult mortality nearly halved in all regions in the eighteenth century.[64] As the figures relate to fathers who were alive on average nineteen years before the marriage of their daughters, mortality first began to fall in East Kent between 1710 and 1730, and in London, the South of England and Durham between 1730 and 1750.
According to Table 9 there were gains in life expectancy throughout the whole of the eighteenth century, although in East Kent most of this took place in the first half of the century. Other evidence indicates that reductions of mortality in Nottinghamshire also appear to have occurred mainly in this period, with the estimated paternal death rate falling from 22 per 1,000 in 1661-63 to 14 per 1,000 in 1754-58 and 10 per 1,000 in 1791-93.[65]
However data on the fathers of masons' apprentices who lived in all areas of the country suggests paternal mortality fell equally in the first and second halves of the century.

[62] Razzell (2016), pp. 45-56.
[63] Razzell (2007), pp. 62, 63.
[64] Information from civil marriage registers in Lancashire and Yorkshire in 1653-60, indicates even higher levels of adult mortality than depicted by Table 9 during the mid-seventeenth century. Razzell (2007), p. 84.
[65] Razzell and Spence (2007), p. 283.

Table 10: Mortality amongst fathers of London indentured masons' apprentices.[66]

Date of indenture	Number of fathers dead	Total number of fathers	Proportion of fathers dead
1663-99	94	223	42%
1700-49	124	375	33%
1750-1805	43	202	21%

Approximately four-fifths of these fathers lived outside London, residing in every county and country of Great Britain.[67]

Evidence from the marriage licences and apprenticeship indentures suggest that adult mortality was higher amongst the wealthy than the poor, and this may have been the case until the end of the nineteenth century.[68] This was probably due to the 'hazards of wealth' – the consumption of very rich food and alcoholic drinks, and a relative lack of exercise – as well as the result of avoiding childhood infections such as smallpox, which took their toll in adulthood.[69]

However, this reverse socio-economic gradient appears to have been established in the eighteenth century, as revealed by the association between occupation and mortality in East Kent during the period between 1619-46 and 1751-1809.

Table 11: Proportion of dead fathers of spinsters marrying under 21, by occupation of husband in East Kent, 1619-1809.[70]

Occupation	*Period*		
	1619-46	1661-1700	1751-1809
Gentlemen, Merchants & Professionals	39%	38%	28%
Yeomen & Farmers	41%	42%	15%
Tradesmen & Artisans	46%	49%	26%
Husbandmen	50%	39%	19%
Mariners & Fishermen	42%	45%	24%

Mortality declined significantly during the eighteenth century, approximately halving in most occupational groups. In the seventeenth century gentlemen, merchants and professionals appear to have lower mortality than other groups, but by 1751-1809 the position had been reversed, with this elite group having the smallest reduction in mortality.

However, there is very detailed evidence of the gains in adult life expectancy amongst wealthy Members of Parliament and the aristocracy. The former data allows a very detailed breakdown of men of different ages living in all areas of England.

[66] For the source of this data see Webb (1999).
[67] Ibid, pp.45-53.
[68] Razzell (2007), pp. 197-226.
[69] Riley (1987).
[70] Razzell (1994), p. 197. For higher paternal mortality amongst gentlemen and professionals than in other groups in Nottinghamshire and Sussex during 1754-1800 see Razzell (2007), p. 117.

Table 12: Mean number of years lived by Members of Parliament, 1660-1820 (Number of cases in brackets).[71]

Period of first entry	Age at First Entry – Mean Number of Years Lived		
	Under 29 years	30-39 years	40 years plus
1660-1690	25.7 (429)	22.6 (458)	17.9 (633)
1715-1754	30.8 (541)	28.2 (422)	18.5 (347)
1755-1789	37.1 (480)	29. 9 (354)	21.2 (431)
1790-1820	38.1 (571)	32.0 (432)	22.4 (572)

All age groups experienced mortality reductions, but the greatest mortality gains were amongst the youngest age cohort under the age of 29. There was an increase in life expectancy of over 12 years in this group, distributed evenly in the entry period between 1660 and 1789. There were also substantial gains in the 30-39 age cohort – of about 10 years – but these were mainly confined to the entry period between 1660 and 1754. There was a modest increase in life expectancy of nearly 5 years in the oldest 40+ group, which was fairly evenly spread between 1660 and 1820. The above pattern of adult mortality is similar to that found by Hollingsworth in his study of the aristocracy.[72] Although all the evidence considered on adult mortality is for males, his study of the aristocracy suggests that females experienced even more mortality reductions in the eighteenth century.[73]

The timing of the reduction in adult mortality was different from the falls in infant and child mortality which appear to have occurred mainly in the second half of the eighteenth century, and given that life table models assume that infant/child and adult mortality move in the same direction, this suggests that these models are not a reliable basis for understanding eighteenth century mortality trends. The Cambridge Group have used such models in calculating figures of adult mortality, but different assumptions may have been one of the reasons why their figures have changed significantly in recent years. In 1997, Wrigley et.al. published life expectancy figures for men aged twenty-five as follows: 1640-89: 30.4 years; 1750-1809: 35.4 years.[74] More recently in 2004, Wrigley has claimed that 'reconstitution data suggest that adult mortality moved from the equivalent of level 5 in model North in the period 1640-89 to the equivalent of level 9 in 1750-1809, or a rise of 10 years.'[75] The latter figure represents a very significant increase over earlier estimates, and is now compatible with the marriage licence and other data reviewed earlier.[76] Wrigley concluded that 'there seems little reason to suppose that the evidence relating to male adult mortality drawn from marriage licences and that drawn from reconstitution are at odds'[77], representing a welcome new consensus.

[71] Razzell (1994), p. 199.
[72] Hollingsworth (1965), p. 56.
[73] Ibid, p. 57
[74] Wrigley et.al., (1997), p. 291.
[75] Wrigley (2004), pp. 427, 428.
[76] According to calculations prepared by Jim Oeppen using the East Kent marriage licence data, there was an increase of 9 years in life expectancy at age 25 between 1650-99 and 1750-1800. Razzell (1994), p. 201.
[77] Wrigley (2004), p. 431.

VII – EXPLAINING MORTALITY REDUCTIONS

The factors responsible for mortality levels are complex. For example, smallpox became much more virulent between the sixteenth and nineteenth century: case fatality rates amongst unprotected children in London rose from about 5% to 45% in this three hundred year period. It is possible that the increasing fatality of smallpox was the result of the importation of more virulent strains with the growth of world trade. It was only the practice of inoculation and vaccination that prevented the disease from destroying a large part of the population.[78] Smallpox also varied in its age incidence between different areas of the country: in the South of England it was a disease of both adults and children, whereas in the North and elsewhere it affected mainly young children. This is important as case-fatality rates differed markedly between different age groups.[79]

To some extent, disease had its own internal logic, so that for example the disappearance of the plague in England in the 1660s does not appear to be the result of any environmental or other improvements. However, it is known that environmental factors did influence the incidence of disease. Mortality was higher in marshland areas, in industrial and urban districts, in certain coastal and estuarine regions, and lower in isolated rural areas with the right geographical and ecological characteristics.[80]

It is possible that the lower levels of infant mortality amongst the wealthier socio-economic groups in Table 8 are partly a function of wealth, although falling elite mortality in the second half of the eighteenth century suggests that non-economic factors were responsible.[81] The rapid fall in child mortality in elite families in the eighteenth century, at a time when it was stable amongst the control population, indicates that this reduction of mortality was exogenous to economic development. Also, the negative association between socio-economic status and child mortality in the mid-nineteenth century depicted in Table 9 and found elsewhere, suggests that disease environment rather than poverty was the most important factor in shaping the level of mortality.

The explanations of these trends are complex: the wealthy are known to have fled London and other towns during the plague, to have escaped childhood diseases such as smallpox by moving away from areas known to be affected by the disease, and to have avoided marsh areas known to suffer from endemic malaria.[82] It is possible among other factors that by the mid-nineteenth century the avoidance of disease was no longer important in protecting wealthy groups from infection, particularly when they lived in urban areas.

The falls in infant mortality in rural and provincial parishes from the middle of the eighteenth century may have been in part due to an autonomous reduction in disease incidence,[83] as well as the result of a variety of health improvements. These included better breastfeeding practices, inoculation/ vaccination against smallpox, and improved personal and domestic hygiene,[84] linked to growing literacy amongst women.

---

[78] Razzell (2003).
[79] Ibid, pp. xi-xix.
[80] Dobson (1997); Razzell (2007), pp. 98, 99.
[81] Also, the level of infant mortality in Bedfordshire was higher amongst the elite than the control population in 1700-49. See Razzell (2007), p. 133.
[82] Riley (1987)*;* Dobson (1997).
[83] Chambers (1972).
[84] Jones and Falkus (1990); Porter (1991); Razzell (1994), pp. 224-229; Razzell (2003).

The dramatic reduction of infant mortality in London was also probably a result of major improvements in public health – increased water supplies, better drainage, and rebuilding of the urban landscape[85] – as well as much better maternal and neo-natal care.[86]

Although most of these measures were not the result of economic developments, clearly economic change did have an indirect influence on mortality. Agricultural improvements led to the drainage of marshland which may have contributed to the elimination of malaria,[87] and the production of cheap cotton cloth enabled working class families to improve their standard of personal hygiene. There was also an economic element in some of the other factors responsible for mortality decline: for example, the rebuilding of houses and house floors in brick and stone. The increasing use of coal enabled water to be boiled more easily, important for personal and domestic hygiene.[88] However, elite social groups had always had the economic resources necessary for these improvements, and the majority of them probably resulted from new attitudes towards disease, personal hygiene and the environment.[89] These changes in attitude and belief appear to have first influenced the educated and wealthy, and gradually spread to the general population later in the eighteenth and nineteenth centuries.

However, the reduction in adult mortality occurred more-or-less equally amongst all areas of the country and in all socio-economic groups, suggesting that there was an 'autonomous' fall in the adult death rate from the early eighteenth century onwards.[90]

VIII – THE HISTORY OF NUPTIALITY ND FERTILTY

The Cambridge Group data in Table 5 suggest that there was no long-term rise in fertility in the eighteenth century, as there were no significant changes in baptism registration reliability or changes in the age structure of the national population. However, the factors shaping fertility are complex and need to be examined in some detail. The Cambridge Group found from their reconstitution research that there was a decline of about two-and-a-half years in the average age of marriage of spinsters during this period.[91] This finding is somewhat contradicted by data from marriage licences – which indicate that average age of marriage rose by about a year in the eighteenth century – but these licences tended to exclude the poorest socio-economic groups.[92]

There is a difficulty with reconstitution calculation of marriage ages. Marriage registers in the early period rarely give information on the marital status of grooms or brides, and there was a major shift in marital status during the eighteenth century. Wrigley and Schofield concluded that 'perhaps as many as 30 per cent of all those marrying were widows or widowers in the mid sixteenth century … By the mid nineteenth century, in contrast, it is clear from civil registration

[85] George (1966); Jones and Falkus (1990); Porter (1991).
[86] George (1966), p. 61; Loudon (1992); Loudon (2000), p. 61.
[87] Dobson (1997).
[88] I would like to thank Tony Wrigley for pointing out the potential importance of coal in boiling water for improving personal hygiene. For the use of boiling water and milk in preventing infant diseases see Marks and Worboys (1997), p. 192.
[89] This shift in attitudes was partly associated with the eighteenth century enlightenment movement. The Royal Society's statistical investigation in the 1720s into the effectiveness of inoculation − comparing natural smallpox mortality with that amongst the inoculated − is perhaps the first historical example of a scientific assessment of a medical treatment. Razzell (2003), pp. 172-74.
[90] Chambers (1972).
[91] Wrigley et.al., (1997), p. 149.
[92] Razzell (2016), p. 71.

returns that a comparable proportion was much lower at 11.27 per cent.'[93] Marriage Licence data confirm this conclusion, but it represents a problem for reconstitution research on marriage ages. During the late seventeenth century about 26 per cent of spinsters in East Kent married widowers, and on average they married 3.8 years later than spinsters marrying bachelors.[94] A twenty per cent reduction in the number of widower marriages would lead to a fall of 0.76 years – 3.8 x 1/5 – in the overall marriage age of spinsters, and this would be the result of the changing marital status of grooms and brides during this transition period.

Nevertheless, new evidence suggests that the fall in the average marriage age of spinsters found by the Cambridge Group is largely genuine. Marriage licences indicate that there was a radical shift in the relative ages at which the wealthy and the poor married in the seventeenth and eighteenth centuries. In Nottinghamshire and Gloucestershire during the seventeenth century the average age of spinsters marrying labourers and husbandmen was over 26 years, whereas the average for yeomen, gentlemen and professionals was between 22 and 24 years.[95] These figures include spinsters marrying both bachelors and widowers, but an analysis of the 100 first cases of spinsters marrying bachelors reveals a similar pattern:

Table 13: Marriages ages of spinsters marrying bachelors in the Diocese of Nottinghamshire, 1672-1685.[96]

Gentlemen & professionals	Yeomen	Artisans & tradesmen	Labourers
Mean = 23.0 Years	Mean = 23.5 Years	Mean = 24.1 Years	Mean = 25.2 Years
Proportion Under 21 = 29%	Proportion Under 21 = 23%	Proportion Under 21 = 9%	Proportion Under 21 = 5%

The high marriage age of spinsters marrying labourers is confirmed by a reconstitution study of marriages occurring in Bedfordshire in the period 1650-1749. It was possible to trace 77 marriages in the baptism register, yielding a mean age at marriage of 26.7 years with 18 per cent marrying under the age of 21.[97] The mean age is higher than that listed in Table 13 for labourers, and this may be because it included marriages to widowers as well as bachelors.

A transition in this pattern occurred in the eighteenth century and was very marked in the Archdeaconary of Chichester, as revealed by the proportions of spinsters marrying under the age of 21:

[93] Wrigley & Schofield (1989), pp. 258, 259.
[94] Razzell (2007), p. 131.
[95] Ibid,, pp. 242, 243.
[96] Blagg and Wadsworth (1930). The Diocese of Nottinghamshire included not only that county, but a number of other northern areas, such as Yorkshire and Derbyshire.
[97] The analysis was carried out on data in the Bedfordshire Family History Database covering 124 parishes in the county, selecting all marriages where the groom was listed as a labourer and the bride as a spinster.

Table 14: Proportion of spinsters marrying under 21 in the Archdeaconary of Chichester, Sussex, 1754-1799.[98]

Period	Labourers		Yeoman, Gentlemen & Professionals	
	Number	Proportion Under 21	Number	Proportion Under 21
1754-69	142	9%	142	22%
1770-99	163	25%	163	14%

By the nineteenth century there were significant differences in marriage ages between these socio-economic groups. Marriage ages were sometimes included in civil registration returns, and an analysis of Surrey and Bedfordshire parishes where such information was recorded, yielded the following differences.

Table 15: Marriages of brides marrying bachelors in Surrey and Bedfordshire, 1837-71.[99]

Grooms occupation	Proportion of brides signing the marriage register	Mean age of marriage (years)	Proportion marrying under twenty-one
Surrey			
Labourers	68.0%	23.0	31.4%
Artisans & Tradesmen	90.0%	24.4	17.2%
Farmers	96.0%	26.1	12.9%
Elite Occupations	99.4%	25.3	17.8%
Bedfordshire			
Labourers	34.2%	22.2	37.6%
Artisans & Tradesmen	67.0%	23.0	26.4%
Farmers	83.3%	25.1	10.5%
Elite Occupations	100%	27.8	15.8%

There was approximately a three year difference in the mean age of marriage between labourers and farmers/ elite occupations, with artisans and tradesmen occupying an intermediate position. There were similar differences in marriage ages of spinsters in England & Wales in 1884-85. The mean age of brides marrying bachelor labourers was 23.7 years, farmers 28.9 years, and professionals 26.4 years.[100] This is the reverse to what was found in the seventeenth century, as a result of labourers' marriage ages falling significantly and those of elite occupations rising during the eighteenth and early nineteenth centuries.

[98] The yeomen, gentlemen and professional cases were matched in sequence to those of labourers' brides. Razzell (2007), p. 244. Hollingsworth found a similar significant increase in marriage ages of aristocratic women in the eighteenth century. Hollingsworth (1965), p. 11

[99] The marriages were selected from parishes in alphabetical sequence up to the parish of Ham in Surrey and Potsgrove in Bedfordshire for the period 1837-71. The numbers of marriages in the calculation of marriage ages were as follows: Surrey: labourers: 1,759; artisans & tradesmen: 2,039; farmers: 102; elite occupations (gentlemen, professionals & merchants): 102. Bedfordshire: labourers: 1,955; artisans & tradesmen: 1,268; farmers: 102; elite occupations: 38.

[100] Woods (2000), p. 86.

As we saw earlier, this was the socio-economic pattern of marriage described by Malthus, with the poor marrying at a much earlier age than the wealthy. He was born in the parish of Wotton, Surrey, where in later life he became curate, and his family home was in the neighbouring village of Albury.[101] He was very familiar with the marriages of the poor of these parishes, as well as the marriage habits of his wealthier contemporaries. It is probable that reduced adult mortality led to the rich to marrying much later, contrasted with the poor marrying much earlier as a result of pauperisation.[102] The artisan and tradesmen class appear to have occupied an intermediate position, with little change in their marriage ages. However, the frequency of marriage was also a major determinant of fertility, and as Wrigley and colleagues have concluded 'that until the middle of the eighteenth century the substantial swings in nuptiality were produced almost exclusively by wide variations in the proportion of women never marrying.'[103]

There is now evidence that marriage was nearly universal in the seventeenth century. Shepard and Spicksley have compiled data from church court depositions covering nearly all areas of England, showing that only about 3 per cent of women aged above 45 were single.[104] Information from a range of other sources – censuses, church court deposition, burial registers, wills and family genealogies – confirm this conclusion.[105] This changed during the eighteenth century as illustrated by data for the London Consistory Court.

Table 16: Proportion of female deponents single in the London Consistory Court, 1583-1817.[106]

Period	Age Group – Proportion Single			
	15-24	25-34	35-44	45+
1586-1611	62%	15%	1%	0%
1703-1713	72%	25%	7%	4%
1752-1783	77%	43%	14%	5%
1792-1817	76%	53%	13%	15%

There were significant reductions in the frequency of marriage in all age groups during the eighteenth century, and this was also the case in Yorkshire and other areas of England.[107] The explanations for this trend are complex but it appears that it occurred particularly amongst the wealthy and the well-educated.[108] There were major changes in literacy levels amongst wealthy

[101] James (1979), pp. 13, 34, 40.
[102] As we saw earlier, Malthus stressed the link in England between poverty and early marriage. There is no consensus on patterns of real income and economic inequality in the eighteenth and early nineteenth century. For example, see Clark (2007), Clark (2009), Broadberry et.al. (2015). However, the increasing pauperisation of labourers at the end of the eighteenth and beginning of the nineteenth century was described by nearly all contemporaries, including Horatio Nelson. See Nicolas (1845), p. 295. See also Howlett, (1796); Davies (1796); Cobbett (2001); Hammond (1911); Hammond (1917); Hammond (1919); Taylor (1969); Inglis (1972); Thompson (1980); Vincent (1981); Humphries (2013).
[103] Wrigley and Schofield (1989), p. xix.
[104] Razzell (2016), p. 65.
[105] Ibid, pp. 60-70.
[106] Ibid, p. 67.
[107] Ibid, pp. 60-70. Recently Szreter and Garrett have argued that there was a decline in the frequency of marriage from the middle of the eighteenth century onwards. Szreter and Garrett (2000), p. 67.
[108] Razzell (2016), pp. 74-77.Church court depositions tended to exclude the very poor.

women in the eighteenth century, as illustrated by the proportion of women signing wills in London.

Table 17: Proportion of women signing London wills, 1599-1851.[109]

Period	Proportion signing wills	Number of cases
1599-1601	2%	100
1639-1641	15%	100
1699-1701	38%	100
1749-1751	64%	100
1799-1801	77%	100
1849-1851	86%	100

However, literacy was not a sufficient condition to sustain a single marital status, as in the late eighteenth century many of the poor were literate but with very high levels of marriage frequency.[110] It was important to have the economic resources to be able to sustain a single marital status, although these are complex issues requiring further clarification.

The socio-economic patterns of marriage age and the frequency of marriage had a direct impact on fertility levels. The general relationship between status and fertility was widely recognised by contemporaries in the nineteenth century, summarised by Wrong as follows:

> *In England most of the writers who took part in the Malthusian controversy in the early part of the nineteenth century were full aware of the existence of a negative relationship between fertility and socio-economic status. It was referred to by Malthus himself, by William Godwin, John Stuart Mill, Harriet Martineau, and Nassau Senior, to mention only a few of the better know intellectual figures of the day.*[111]

Glass was the first to analyse the relationship between socio-economic status and fertility which occurred in the middle of the 19th century. He found a strong correlation between the status of a London registration district and its gross reproduction rate in the period 1849-51, even allowing for the presence of servants.[112] There were similar associations in other wealthy and poor districts, with the wealthy areas having higher literacy and lower fertility rates.[113] Data for Bedfordshire indicates that fertility was particularly high amongst labourers compared to other occupational groups:

[109] Ibid, p. 86. The figures are based on the first 100 women leaving wills selected alphabetically in the periods in question.
[110] Ibid, pp. 75-77.
[111] Wrong, (1958), p. 67.
[112] Glass, (1938), p. 118.
[113] Razzell (2016), pp. 81-83.

Table 18: Bedfordshire baptism fertility rates, 1849-51.[114]

Occupational Group	Number of Baptisms 1849-51	Number of Men Living Aged 20-50 in 1851	Annual Fertility Rate per 100 Living
Labourers	5,280	10,887	16.2
Artisans, Tradesmen & Others	3,008	11,120	9.0
Farmers	294	1,148	8.5

The findings on status and fertility are consistent with the evidence on the relationship between status and nuptiality previously discussed. The overall impact of nuptiality patterns and fertility levels is more difficult to assess. The falling mean age of marriage amongst labourers – and they formed a large part of the total population – has to be contrasted with the declining frequency of marriage amongst other groups. The best evidence on changing fertility levels in the eighteenth century is provided by Table 5, which indicates that there was no significant change during this period, suggesting that the decline in mean marriage age was balanced by an overall reduction in the frequency of marriage.[115]

VIII – CONCLUSION

There is an increasing consensus that much of England's economic development was fuelled by the growth of capitalism. Harley has recently concluded that 'the emergence of Britain modern growth depended more on a long history of capitalism than on the industrial revolution,'[116] a conclusion supported by the work of Leigh Shaw-Taylor of the Cambridge Group.[117] Much of this development was shaped by the availability of cheap labour, as recognized by Malthus when he wrote that 'farmers and capitalists are growing rich from the real cheapness of labour.'[118] On the central argument of this paper, the supply of labour was largely determined by population growth.

There is a parallel between England's demographic and economic development and that which is currently occurring world-wide. There is now evidence that world population growth was not mainly shaped by economic factors, but was largely the result of changes in the disease environment, particularly the adoption of improved personal and public hygiene and the application of modern medicine.[119] This has led to rapidly falling mortality even in very poor countries, creating labour surpluses, which have been exploited by multi-national companies for the maximisation of profits. This has led to the growth of world-wide capitalism, transforming the economic structures of both developing and developed countries, a process which is only likely to change when labour surpluses are eliminated through long-run reductions in fertility.

---

[114] Ibid, p. 84.
[115] I had previously argued that fertility reduced during this period, but the new evidence on nuptiality suggests that it was unchanging during the eighteenth century.
[116] Harley (2014), p. 492.
[117] Shaw-Taylor (2012).
[118] Malthus (1992) Vol. ?, p. 28 ???.
[119] Easterlin (1999); Cutler, Deaton and Llera-Muney (2006); Easterlin (2012).

REFERENCES

ARMSTRONG W.A., 1981, "The end of mortality in Carlisle between the 1780s and the 1840s: a demographic contribution to the standard of living debate", Economic History Review, 34, pp. 94-114.

BAKER D., 1973, The Inhabitants of Cardington, Bedfordshire Historical Record Society, 52.

BLAGG T.M., WADSWORTH F.A. (eds.), 1930, Abstracts of Nottinghamshire Marriage Licences 1577-1700, London, British Record Society Index Library, 58.

CHAMBERS D., 1972, Population, Economy and Society in Pre-Industrial England, Oxford, Oxford University Press.

COBBETT W., 2001, Rural Rides, London, Penguin Classics.

CUTLER D.M., DEATON A.S., LLERA-MUNEY A., 2006, "The determinants of mortality", Journal of Economic Perspectives, 20, pp. 97-120.

DAVIES D., 1796, The Case of Labourers in Husbandry, Bath, R. Crutwell.

DOBSON M., 1997, Contours of Death and Disease in Early Modern England, Cambridge, Cambridge University Press.

EASTERLIN, R.A., 1999, "How beneficent is the market? A look at the modern history of mortality", European Review of Economic History, 3, pp 257-294.

EASTERLIN R.A., 2012, "Cross sections are history", Population and Development Review, 38 (Supplement).

GALLEY C., 1998, The Demography of Early Modern Towns; York in the Sixteenth and Seventeenth Centuries, Liverpool, Liverpool University Press.

GALLEY C., GARRETT E., DAVIES R., REID A., 2011, "Living same-name siblings and English historical demography", Local Population Studies, 86, pp.15-36.

GALLEY C., GARRETT E., DAVIES R., REID A., 2011a, "Living same-name siblings and English historical demography: a reply to Peter Razzell", Local Population Studies, 87, pp.70-77.

GALLEY C., GARRETT E., DAVIES R., REID A., 2012, "Living same-name siblings and English historical demography: a final comment", Local Population Studies, 88, pp. 82, 83.

GEORGE D., 1966, London Life in the Eighteenth Century, London, Penguin Books.

GLASS D.V., 1938, "Fertility and economic status in London", Eugenics Review, 30, pp. 117-124.

GLASS D.V., EVERSLEY D.E.C., (eds.), 1965, Population in History: Essays in Historical Demography, London, Edward Arnold.

HAJNAL, J., 1965, "European marriage patterns in perspective", in Glass D.V., Eversley D.E.C., (eds.), Population in History: Essays in Historical Demography, London, Edward Arnold, pp. 101-143.

HAMMOND, J., HAMMOND, B., 1911, The Village Labourer, London, Longmans.

HAMMOND, J., HAMMOND, B., 1917, The Town Labourer, London, Longmans.

HAMMOND, J., HAMMOND, B., 1919, The Skilled Labourer, London, Longmans.

HARLEY C.K., 2014, "British and European industrialization" in L. Neal and J.G. Williamson (eds.), Capitalism: Volume 1: The Rise of Capitalism from Ancient Origins to 1848, Cambridge, Cambridge University Press, pp. 491-532.

HEBERDEN W., 1801, Observations on the Increase and Decrease of Different Diseases, London, T. Payne.

HOLLINGSWORTH T.H., 1965, The Demography of the British Peerage, Population Studies, Supplement Volume 18, pp. 1-108.
HOUSTON R, 1992, "Mortality in early modern Scotland: the life expectancy of advocates", Continuity and Change, 7, pp. 47-69.
HOWLETT J., 1796, Examination of Mr Pitt's Speech in the House of Commons February 12th 1796 Relative to the Condition of the Poor, London, W. Richardson.
HUCK P., 1994, "Infant mortality in nine industrial parishes in northern England, 1813-36", Population Studies, 48, pp. 513-526.
HUMPHRIES J., 2013, "The lure of aggregates and the pitfalls of the patriarchal perspective: a critique of the high wage economy interpretation of the British industrial revolution", Economic History Review, 66, pp. 693-714.
INGLIS B., 1972, Poverty and the Industrial Revolution, London, Panther Books.
JAMES P., 1979, Population Malthus: His Life and Times, London, Taylor and Francis.
JONES E.L., FALKUS M.E., 1990, "Urban improvement and the English economy in the seventeenth and eighteenth centuries" in P. Borsay (ed.), The Eighteenth Century Town: 1688-1820, London, Longman.
JONES R.E., 1980, "Further evidence on the decline of infant mortality in pre-industrial England: north Shropshire, 1561-1810", Population Studies, 34, pp. 239-250.
KEYNES J. M., 2010, Essays in Biography, (ed.) G. Keynes, Basingstoke, Palgrave Macmillan.
KEYNES J. M., 2012, The Collected Writings of John Maynard Keynes, Volume 7, London, Royal Economic Society.
LANDERS J., 1991, London Mortality in the 'Long Eighteenth Century', Medical History, Supplement Number 7.
LEE R., LAM D., 1983, "Age distribution adjustments for English censuses, 1821 to 1931", Population Studies, 37, pp. 445-464
LOUDON I, 1992, Death in Childbirth: an International Study of Maternal Care and Maternal Mortality, 1800-1950, Oxford, Oxford University Press.
LOUDON I., 2000, The Tragedy of Childbed Fever, Oxford, Oxford University Press.
MALTHUS T. R., 1803, An Essay on the Principal of Population, London, J. Johnson.
MALTHUS T. R., 1989, An Essay on the Principal of Population, Volumes 1 & 2 (ed.) P. James, Cambridge, Cambridge University Press.
MARKS I, WORBOYS, M., 1997, Migrants, Minorities and Health, London, Routledge.
MITCHELL B.R., DEANE P., 1971, Abstracts of British Historical Statistics, Cambridge, Cambridge University Press.
NICOLAS, N.H., 1845, The Dispatches and Letters of Vice Admiral Lord Viscount Nelson, Volume 1, 1777-94, London, Henry Colburn.
PORTER R., 1991, "Cleaning up the Great Wen: public health in eighteenth century London, in W.F. Bynum and R. Porter (eds.) Living and Dying in London, Medical History Supplement Number 11, London.
RAZZELL P.E., 1994, Essays in English Population History, London, Caliban Books.
RAZZELL P.E., 2003, The Conquest of Smallpox, London, Caliban Books.
RAZZELL P.E., 2007, Population and Disease: Transforming English Society, 1550-1850, London, Caliban Books.
RAZZELL P.E., 2011, "Living same-name siblings in England, 1439-1851", Local Population Studies, 87, pp. 65-69.

RAZZELL P.E, 2012, “Living same-name siblings in England, 1439-1851: a commentary”, Local Population Studies, 88, pp. 76-81.
RAZZELL P.E., 2016, Mortality, Marriage and Population Growth in England, 1550-1850, London, Caliban Books.
RAZZELL P.E., SPENCE C., 2007, “The history of infant, child and adult mortality in London, 1550-1850”, The London Journal, 32, pp. 271-292.
RAZZELL P.E., SPENCE C., WOOLLARD, M., 2010, “The evaluation of Bedfordshire burial registration”, Local Population Studies, 84, pp. 31-54.
REGISTRAR-GENERAL SUPPLEMENT, 45TH ANNUAL REPORT.
RILEY J.C., 1987, The Eighteenth Century Campaign to Avoid Disease., Basingstoke, Palgrave Macmillan.
SHAW-TAYLOR, L., 2012, The rise of agrarian capitalism and the decline of family farming”, Economic History Review, 65, pp. 26-60.
SMITH A., 1976, An Inquiry into the Nature and Causes of the Wealth of Nations, Volume 1, Oxford, Oxford University Press.
SZRETER S., GARRETT, E., 2000, “Reproduction, compositional demography, and economic growth: family planning in England before the fertility decline”, Population and Development Review, 26, pp. 45-80.
SZRETER, S., MOONEY, G., 1998, “Urbanization, mortality and the standard of living debate: new estimates of the expectation of life at birth in nineteenth century British cities”, Economic History Review, 51, pp. 84-112.
TAYLOR, G., 1969, The Problem of Poverty, 1660-1834. London, Longman.
THOMPSON, E.P., 1980, The Making of the English Working Class, London, ?
VINCENT D., 1981, Bread, Knowledge and Freedom: a Study of Nineteenth Century Working Class Autobiography, London, Methuen.
WOODS, R., 2000, The Demography of Victorian England and Wales, Cambridge, Cambridge University Press.
WRIGLEY E.A., 2004, Poverty, Progress and Population, Cambridge, Cambridge University Press.
WRIGLEY E.A., SCHOFIELD, R.S., 1989, The Population History of England 1541-1871, Cambridge, Cambridge University Press.
WRIGLEY E.A., DAVIES R.S., OEPPEN J.E., SCHOFIELD R.S., 1997, English Population History from Family Reconstitution 1580-1837, Cambridge, Cambridge University Press.
WRONG J., 1958, “Class fertility differentials before 1850”, Social Research, 25, pp. 70-86.

Population Growth and the Increase of Socio-Economic Inequality in Britain.

Peter Razzell

Abstract

Thomas Piketty has traced historical patterns of socio-economic status, including a significant rise in inequality in Britain since the 1980s. He has attributed these changes mainly to economic factors, but the present paper presents evidence to show that demographic forces have had an independent influence on patterns of inequality. It is argued that population growth historically brought about an increase in inequality in Britain through the creation of labour surpluses. Additionally, the paper presents evidence to show that falling mortality in China led to a rapid increase in its population after the middle of the twentieth century, resulting in the creation of a large amount of cheap labour. This has enabled it to export manufactured goods on major scale, resulting in the erosion of the manufacturing base of Britain's economy, leading to significant regional socio-economic inequalities.

Keywords

Population, mortality, surplus labour, Britain, history, regional inequality, China, manufacturing activity.

Introduction

In his study of income and wealth inequalities, Thomas Piketty has written that:

> For far too long economists have sought to define themselves in terms of their supposedly scientific method. In fact, those methods rely on an immoderate use of mathematical methods ... the new methods often lead to a neglect of history and of the fact that historical experience remains our principle source of knowledge. (Piketty 2014: 574-575)

Piketty has quoted historical evidence for England, including the structure of income and wealth in the early nineteenth century through the works of Jane Austen. This paper seeks to place the debate about socio-economic inequality in a broader historical context, in part by examining the relationship between population and socio-economic status in England & Wales from the sixteenth century onwards, as well as analysing the impact of global population growth on current patterns of inequality.

Malthus was one of the first to recognise the role of surplus labour in the growth of inequality, concluding that at the beginning of the nineteenth century 'farmers and capitalists are growing rich from the real cheapness of labour'. (Malthus 1989, Volume 1: 28). This

directly links the incomes of the poor with the wealth of the rich, and I will examine accounts of the lives of the poor to provide a counterpoint to Austen's descriptions of the lives of the wealthy.

Malthus has been the most important influence on thinking about the relationship between demographic and economic development. In his theoretical work, he emphasized the impact of economic factors on fertility and population levels, through shifts in the incidence of marriage. (Malthus 1989, Volume 1: 15, 92, 192, 193) He had been influenced by Adam Smith, who had argued that 'the demand for men, like that for any other commodity, necessarily regulates the production of men; quickens it when it goes on too slowly, and stops it when it advances too fast.' (Smith 1976, Volume 1: 98) Malthus's work in turn influenced Ricardo, Marx, Marshall and other classical economists, who all assumed the primacy of economics over demography. The exception was Keynes, who accepted that population affected levels of aggregate demand – he was a strong admirer of Malthus – but had little or nothing to say about the impact of population growth on the supply side, in particular the supply of labour. (Keynes 2010 and 2012).

Although Malthus's theory of population stressed the economic basis of marriage and fertility − a growth in income leading to earlier marriage and a rise in fertility − in his account of England's experience he reversed his analysis. He concluded that mortality associated with the disease environment was the key driver of population growth, (Malthus 1803: 311) and that

> … the gradual diminution and almost total extinction of the plagues which so frequently visited Europe, in the seventeenth and the beginning of the eighteenth centuries, produced a change [in the incidence of marriage] … in this country [England] it is not to be doubted that the proportion of marriages has become smaller since the improvement of our towns, the less frequent return of epidemics, and the adoption of habits of greater cleanliness. (Malthus 1989, Volume 2: 198).

Malthus in his empirical writings gave a sociological rather than an economic analysis of marriage: 'It is not … among the higher ranks of society, that we have most reason to apprehend the too great frequency of marriage … [it is] squalid poverty ... [which] prompt universally to early marriage ...' (1989, Volume 1: 439, Vol. 2: 114, 150).

Population change and economic inequality

The relationship between demographic and economic development was explored by H.J. Habakkuk who put forward a general thesis on the relationship between population and economic history in England before the nineteenth century. He presented a 'heroically simplified version of English history', which ran as follows

> ... long-term movements in prices, in income distribution, in investment, in real wages, and in migration are dominated by changes in the growth of population. Rising population: rising prices, rising agricultural profits, low real incomes for the mass of

> the population, unfavourable terms of trade for industry − with variations depending on changes in social institutions, this might stand for a description of the thirteenth century, the sixteenth century and the early seventeenth, and the period 1750-1815. Falling or stationary population with depressed agricultural profits but higher mass incomes might be said to be characteristic of the intervening periods. (Habakkuk 1965: 148)

This argument assumes that population change was largely independent of economic development, an assumption confirmed by research which has established that population growth was mainly the consequence of reductions in mortality resulting from changes in the disease environment. (Razzell 1993; Razzell 2016). This in effect establishes population as an exogenous variable in economic growth, contrary to the assumptions made by classical economists and the majority of economic theorists.

It is not possible to test Habakkuk's thesis in any detail because there is no consensus on economic trends and changes in the economy during the early modern period. For example, there is a fundamental disagreement between Gregory Clark on the one hand, and Stephen Broadberry and colleagues on the other about long-term economic growth in England in the period between the fifteenth and early the nineteenth century. The former concluded that there were no significant change in per capita incomes between the fifteenth and eighteenth centuries, whereas Broadberry et.al. have argued that GDP per head approximately doubled in the same period. (Clark 2007; Broadberry et.al. 2015) The different conclusions are the result of disagreements on estimates of population, employment and occupational levels. The problem is that there is no reliable national evidence to evaluate competing ideas, and attempts to resolve these difficulties have led to the use of mathematical models which necessarily require a range of arbitrary assumptions. The lack of reliable national evidence has bedevilled the long standard of living debate, which is unlikely to ever be resolved be econometric data.

There is however local statistical and literary evidence for specific periods that can be used for an evaluation of Habakkuk's thesis and illuminate the relationship between population change and socio-economic inequality. The second half of the sixteenth century was a period of rapid population growth and an increase in prices. Population grew by over 30 per cent in the period 1570-1609 and prices more than doubled between 1550 and 1600. (Wrigley and Schofield 1981; Mitchell and Deane 1971: 484-486; Thirsk 1967: 857, 858, 1861; Phelps-Brown and Hopkins 1962, Volume 2: 193-195). Lawrence Stone noted the changes that had taken place in English society during the sixteenth century as a result of population growth: 'the excess supply of labour relative to demand not only increased unemployment, but forced down real wages to an alarming degree ... [there was] a polarisation of society into rich and poor: the upper classes became relatively more numerous and their real incomes rose; the poor also became more numerous and their real incomes fell.' (Stone 1966: 26-29, 49)

Recent research by Alexandra Shepard using church court depositions indicates that wealth inequality increased markedly during the sixteenth century. In the mid-sixteenth century the mean evaluation of wealth of yeoman was £9.88; by the second quarter of the seventeenth century it had risen to £143.06. By contrast labourers' average wealth rose from

£2.03 to £4.75, and allowing for inflation, the real wealth of labourers diminished during this period. (Shepard 2015: 68-72)

Population growth and the life of the poor in the eighteenth and nineteenth centuries.

After a period of stagnation in the second half of the seventeenth and first half of the eighteenth century, population began to grow after the middle of the eighteenth century, accelerating rapidly at the end of the eighteenth and beginning of the nineteenth century. (Wrigley and Schofield 1981; Razzell 2017) There is no current consensus on the changing pattern of real income and economic inequality during the seventeenth and eighteenth centuries. (Humphries 2013: 693-714; Lindert 2000) However, there is evidence from contemporary witnesses on the lives of the poor to suggest that the labourers became increasingly pauperized in the late eighteenth century. (Snell 1985: 25, 26) Admiral Horatio Nelson in a letter to the Duke of Clarence in 1790 described the condition of the poor in Norfolk as follows:

> That the poor labourer should have been seduced by promises and hopes of better times, your Royal Highness will not wonder at, when I assure you, that they are really in want of everything to make life comfortable. Hunger is a sharp thorn, and they are not only in want of food sufficient, but of clothes and firing. (Nicolas 1845: 295)

Nelson also claimed that labourers could not afford candles, soap or shoes, and for 'drink nothing but water, for beer our poor labourers never taste.' (Coleman 2001: 101; Nicolas 1845: 297)

One of the most detailed accounts was provided by the Reverend John Howlett, who had been the Vicar of Great Dunmow in Essex for about 50 years. Describing the condition of labourers in his parish he wrote in 1796:

> … for the last forty or fifty years, some peculiarly favoured spots excepted, their condition has been growing worse and worse, and is, at length, become truly deplorable. Those pale famished countenances, those tattered garments, and those naked shivering limbs, we so frequently behold, are striking testimonies of these melancholy truths. (Howlett 1796: 2)

He argued that these developments were the result of 'the rapid increase of population on the one hand and from the introduction of machines and variety of inventions … [which have led to] more hands than we are disposed or think it advantages to employ; and hence the price of work is become unequal to the wants of the workmen.' (1796: 19) He compiled figures of income and expenditure, using details of wages from farmers' wage books and local knowledge of family incomes and consumption, for the two ten-year periods, 1744-53 and 1778-87. The annual expenditure per family in the first period was £20.11s.2d and earnings £20.12.7d, leaving a surplus of 1s.5d. In the second period the figures were £31.3s.7d and £24.3.5d, leaving a deficit of £7.0s.2d. (1796: 19) Howlett concluded that

> Of this deficiency the rates have supplied about forty shillings; the remaining £5 have sunk the labourers into a state of wretched and pitiable destitution. In the former period, the man, his wife, and children, were decently clothed and comfortably warmed and fed: now on the contrary, the father and mother are covered with rags; their children are running about, like little savages, without shoes or stockings to their feet; and, by day and night, they are forced to break down the hedges, lop the trees, and pilfer their fuel, or perish with cold. (1796: 49)[1]

Although there is no reliable national statistical data to support the local evidence, there is some data for southern and western counties which indicates that there were sharp falls in the real incomes of poor men and women in the late eighteenth and early nineteenth century. Keith Snell has compiled figures of the annual wages of southern and western farm and domestic servants taken from poor law settlement examinations. These figures cover the whole period 1741-1840 and have the advantage of relying on direct witness statements. They focus on unmarried young men and women hired by the year, which conferred poor law settlement. They relate to employment for the whole year, and were paid at the end of the year, addressing the major difficulty of establishing changing unemployment levels. These categories of worker were boarded and lodged during the year, so in that sense were safeguarded from many of the effects of price fluctuations. Frequently their statements were checked by parish authorities, providing some independent surety for their reliability. There is some evidence from other sources which suggests that these trends proximate to weekly wage trends affecting other largely unskilled rural and market-town workers in these southern and western English counties. (Snell 1985: 23-28)

Table 1: Mean Real Wages (£) of Farm and Domestic Servants in Southern and Western Counties, 1741-1840. (Snell 1985: 29, 411-417; Phelps-Brown and Hopkins 1962)

Period	Mean Real Male Annual Wages (£)	Mean Real Female Annual Wages (£)
1741-50	7.398	4.802
1751-60	5.919	4.546
1761-70	7.994	4.532
1771-80	7.361	4.226
1781-90	7.751	4.007
1791-1800	6.614	3.541
1801-10	5.212	3.319
1811-20	4.9	3.574
1821-30	5.43	4.421
1831-40	4.828	4.086

[1]For a similar account of the condition of labourers, see (Davies 1796: 7). Contemporaries were almost unanimous in depicting the plight of labourers and the poor in Southern and Midland counties in a similar vein to that described by Howlett. For a bibliography of these accounts see (Snell 1985: 25).

Male mean wages were more-or-less constant in the period between 1741 and 1790 but fell sharply in the period 1791-1840. Female real wages fell gradually from the 1740s onwards, with a slight recovery in the two decades between 1821 and 1840.

Real wages were higher in the North of England (Mitchell and Deane 1971: 346, 347) but there is some evidence that the pauperisation of the working class was not confined to the South of England. (Razzell and Wainwright 1973: xix-xxiv). Charles Shaw in his autobiography described the conditions of workers in the Staffordshire Potteries in the 1830s and 1840s:

> All the great events of the town took place … [in] the market place. During the severity of winter I have seen one of its sides nearly filled with stacked coals. The other side was stacked with loaves of bread, and such bread. I feel the taste of it even yet, as if made of ground straw, and alum, and Plaster of Paris. These things were stacked there by the parish authorities to relieve the destitution of the poor. Destitution, for the many, was a chronic condition in those days, but when winter came in with its stoppage of work, this destitution became acute, and special measures had to be taken to relieve it. The crowd in the market-place on such a day formed a ghastly sight. Pinched faces of men, with a stern, cold silence of manner. Moaning women, with crying children in their arms, loudly proclaiming their sufferings and wrongs. Men and women with loaves or coals, rapidly departing on all sides to carry some relief to their wretched homes − homes, well, called such … This relief, wretched as it was, just kept back the latent desperation in the hearts of these people. (Shaw 1980: 42-43)

Underlying many of these conditions were the increasing employment of cheap labour. (Mayhew 1980) In 1809, the abolition of protective legislation had allowed the increasing employment of children and unskilled workers in the new factories. (Thompson 1980: 529) Over 80 per cent of the labour force in English and Scottish factories in 1833 was women and children, paid about a third of the wages of male workers. (Humphries 2010; Razzell 2016: 106).

Not all the worst conditions were found in the new factories, they were often found in small sweated workshops and among garret masters working from home, described by Mayhew in such detail. (Mayhew 1980, 6 Volumes) Many people were forced to work in these places because of a surplus of labour. One of Mayhew's informants told him:

> The speculators find plenty of cheap labour among the country lads. A hand fresh up from the country can't get employment at the best shops, unless he's got some friends, and so, after walking all London, he is generally down to look for a job among the speculators at low wages. (1980, Volume 5: 108)

It was not just low wages, but a high incidence of unemployment that was the cause of much poverty. Mayhew stated that 'in the generality of trades the calculation is that one-third of the hands are fully employed, one third partially, and one-third unemployed throughout the year.'

(1980, Volume 2: 300) One boot-maker in Mayhew's survey directly linked demographic trends with its impact on aggregate demand and increasing poverty levels:

> The cause of the trade being so overstocked with hands is, I believe, due in great measure to the increase in population. Every pair of feet there is born, certainly wants a pair of shoes; but unfortunately, as society is at present constituted, they cannot get them. The poor, you see sir, increase at a greater rate than the rich. (1980 Volume 3: 139)

A witness before the 1833 House of Commons Select Committee on the State of Agriculture stated that 'it is the surplus of labourers that are suffering, of which there are many in almost every parish, and these men are very badly off … It used to be customary to have them [employed] for a whole year and employ them in the winter, but that is not the case now.' (Neuman 1982: 20) A detailed account of the life of agricultural labourers was provided by the Morning Chronicle Survey in the middle of the nineteenth century:

> Their labour is at the command of anyone who bids for it; and as their employment is precarious, and their wages fluctuating, their lives are spent, in the majority of cases, in constant oscillation between their homes and the workhouse … If the reader will accompany me, I shall lead him into a cabin constituting the abode of [the labourer] …As you enter, a woman rises … and has an infant in her arms, and three other children … There are two boys who are out with their father at work … the mother takes a pot from the fire, and pours out of it a large dish of a quantity of potatoes. This together with a little bread and some salt butter for the father and the two eldest boys, forms the entire repast. (Razzell and Wainwright 1973: 3-5)

The growth of capitalism

Many of the above developments were associated with the growth of capitalism, linked to the creation of labour surpluses resulting from population growth. (Whittle 2000; Shaw-Taylor 2012; Harley 2014; Razzell 2016: 99-108) The development of capitalism in the sixteenth century can be illustrated by the economic activities of Shakespeare and his father John Shakespeare. The latter had carried out extensive trading practices – the illegal sale of wool, lending of money and the hoarding of grain and other foodstuffs. (Razzell 1990: 16-20) His son William was associated with these activities, and in 1598 was prosecuted for the illegal storage of grain. This practice however was carried out by nearly all the wealthy men in Stratford, along with the four local magistrates who were meant to enforce the legislation against the forestalling and hoarding of grain. This was a time when about 40 per cent of Stratford's population were designated as poor. (1990, 141-143)

At the end of the eighteenth century Cobbett described the further development of capitalism, arguing that bankers and city merchants played a significant role in the consolidation of estates and farms:

> The small gentry, to about the third rank upwards … are all gone, nearly to a man, and the small farmers with them. The Barings [merchant bankers] alone have, I should think, swallowed up thirty or forty of these small gentry without perceiving it … The Barings are adding field to field and tract to tract in Herefordshire; and as to the Ricardos, they seem to be animated with the same laudable spirit ... [acquiring a number of] estates … (Cobbett 2001: 223)

He further described the way the gentry and aristocracy employed urban stock brokers to speculate in stocks and shares, directly linking rural and urban capitalism (2001: 6, 115), which is confirmed by Stone's account of the economic activities of the aristocracy in the eighteenth and nineteenth centuries:

> By 1750 there were few great landlords who did not have some money – often a great deal – in the public funds of the Bank of England. In this sense they were themselves becoming inextricably linked with the monied interest, and their mental attitudes to banking and stock speculation changed accordingly … Others poured surplus cash into canal companies and turnpike trusts in the eighteenth century, and into railroad companies and dockyards in the nineteenth. From the early seventeenth century onward many were deeply involved in urban development of London. (Stone 1995: 189)

The poverty of workers in factories was directly linked to the increasing wealth of the factory owners, described by an anonymous cotton spinner in 1818 as follows:

> … with very few exceptions, they [the employers] are a set of men who have sprung from the cotton-shop without education or address … but to counterbalance that deficiency, they give you enough of appearances by an ostentatious display of elegant mansions, equipages, liveries, parks, hunters, hounds … They bring up their families at the most costly schools … and to support all this… their whole time is occupied in contriving how to get the greatest quantity of work turned off with the least expence … the greater part of the master spinners are anxious to keep wages low … for the purpose of taking the surplus to their own pockets. (Razzell 2007: 199, 200)

In England, the growth of capitalism was linked to economic development, and Harley has recently concluded that 'the emergence of Britain's modern growth depended more on a long history of capitalism than on the industrial revolution.' (Harley 2014: 492)

Global population growth and regional inequality in Britain

Piketty has provided convincing evidence that socio-economic inequality has grown significantly in Britain since the 1980s. (Piketty 2014: 316, 319, 323, 344) He has presented two main hypotheses to explain this trend: 1. The ability of owners and managers of large companies to set high incomes and bonuses for themselves, linked to the growth of

monopolistic global companies. 2. The greater increase of the returns from capital compared to the rate of growth in the overall economy. (2014: 24, 25)

Both these hypotheses are compatible with known trends in the economy, but fail to mention the influence of demographic factors on current levels of socio-economic inequality. The period since the 1970s is one of economic globalisation, and inequality has been significantly shaped by global demographic trends. As with the history of England & Wales, most world-wide population growth has resulted from reductions in mortality. This has been driven not by economic development but by the control of the disease environment, through applications of modern medicine and improvements in personal and public hygiene. (Preston 1975; Easterlin 1999; Cutler, Deaton and Llera-Muney 2006; Easterlin 2012; Razzell 2016: 120-122) This has occurred sometimes in very poor countries which have benefited from medical and other forms of aid. (Caldwell 1986) This has invariably happened during periods of high fertility as a part of the demographic transition (Harper 2016), and as in England & Wales led to rapid population growth and the creation of labour surpluses. (Razzell 2016)

The most important global demographic development was that which occurred in China. Its population grew rapidly after 1960, fuelled largely by increasing life expectancy.

Table 2: Life Expectancy and Population Growth in China, 1960-2015. (World Bank Data Online)

Year	Life Expectancy (Years)	Population Size
1960	43.8	667,070,000
1980	66.6	981,235,000
2015	76.1	1,379,000,000

Its real income per head was a fraction of that in the United Kingdom, even after a period of significant growth between 1970 and 2016.

Table 3: GNI per Capita (U.S.A. Dollars) in China and the United Kingdom, 1970 and 2016. (World Bank Data Online)

Year	China	United Kingdom
1970	120	2,430
2016	8,260	42,390

.

China's very large population and cheap labour allowed it to develop a highly competitive manufacturing export industry, gradually eroding the manufacturing industries of Britain, Europe and the United States. As Nicholas Comfort has concluded, 'Over the decades that followed [from 1989 onwards] China, whose Communist Party had approved the opening up of the economy as far back as 1978, would embrace a rampant capitalism ... that would in turn generate an export-led boom giving it a near-stranglehold over the global economy.' (Comfort 2013: 170)

These developments in China and elsewhere in Asia have had a major impact on Britain's economy and society. Manufacturing as a proportion of all employment in the

United Kingdom fell from 22% in 1982 to 15% in 1992 and 8% in 2015. (Manufacturing Statistics 2015). Multinational companies have exploited labour surpluses for the maximisation of profit, transferring industrial production from developed to developing countries, with an increasing reliance on services in the developed world. The impact of these changes on the UK's economy has been summarized as follows:

> In 1950, in the aftermath of the Second World War, the UK accounted for more than 10% of global exports, yet by 2009 that share had declined to just under 3%. The UK's manufacturing sector has shrunk by two-thirds in the three decades between 1980 and 2010. Whereas a million people made cars in the UK during the 1960s, but by 2009 that number was just 180,000 ... by the 1980s the cotton industry had vanished. In 1983 there were 170 working coal mines, but by 2009, there were 4. After World War 2, manufacturing accounted for almost 40% of UK's economy. Manufacturing is now just a tenth of the UK economy ... and the service industry is now 75.8%. (Taylor 2011)

These changes have had a major impact on patterns of socio-economic inequality. As the *Economist* has recently observed: 'When countries with lots of low-wage workers begin trading with richer economies, pay for similarly skilled workers converges. Those in poor countries grow richer while in richer countries workers get poorer.' (The *Economist* 21st October 2017: 20). This process has a particular impact on the different regions of the wealthier countries, creating poverty in the old industrial communities but increased wealth in regions specializing in services. An example of this is to be found in patterns of household expenditure and property prices in different regions in England & Wales.

Table 4: Regional Gross Disposable Household Income and Property Prices in England & Wales. (GovUk Online 2017)

Region	Manufacturing As A Proportion Of All Jobs, 1991	Manufacturing As A Proportion Of All Jobs, 2015	Gross Disposable Annual Income Per Head, 2014 (£)	Average House Price, March 2017 (£)
West Midlands	30%	11%	15,611	180,293
East Midlands	30%	12%	16,217	176,213
Yorkshire & Humber	25%	11%	15,498	149,606
North West	25%	9%	15,776	150,250
North East	24%	9%	15,189	122,298
Wales	23%	10%	15,302	147,746
East	22%	8%	18,897	277,127
South West	19%	8%	18,144	240,222
South East	17%	6%	20,434	311,514
London	11%	2%	23,607	471,742

Although not a perfect correlation, the northern regions with the greatest historical reductions in the amount of manufacturing industry have lower household incomes and property values than elsewhere. This is the reverse of the pattern in the nineteenth century, where incomes were higher in the industrial regions of the north of England. (Mitchell and Deane 1971: 346, 347)

The impact of the process of de-industrialization has been summarized by Aditya Chakrabortty in 2011 as follows:

> Before moving to Yale and becoming a bestselling historian, Paul Kennedy grew up on Tyneside in the 50s and 60s. "A world of great noise and much dirt," is how he remembers it, where the chief industry was building ships and his father and uncles were boilermakers in Wallsend. Last year the academic gave a lecture that reminisced a little about those days. "There was a deep satisfaction about making things," he said. "A deep satisfaction among all of those that had supplied the services, whether it was the local bankers with credit; whether it was the local design firms. When a ship was launched at [the Newcastle firm] Swan Hunter all the kids at the local school went to see the thing our fathers had put together ..."
>
> Wandering around Wallsend a couple of weeks ago, I didn't spot any ships being launched, or even built. The giant yard Kennedy mentioned, Swan Hunter, shut a few years back, leaving acres of muddy wasteland that still haven't lured a buyer. You still find industrial estates, of course ... The biggest unit on one estate is a dry cleaner; on another, a warehouse for loft insulation dwarfs all else. At a rare actual manufacturing firm, the director, Tom Clark, takes me out to the edge of the Tyne, centre of the industrial excitement remembered by Kennedy. "Get past us and there's nothing actually being made for miles," he says, and points down the still waterfront.
>
> At his firm, Pearson Engineering, Clark introduces me to a plater called Billy Day. Now 51, he began at the firm at 16. His 23-year-old son William is still out of work, despite applying to dozens of small factories. As the local industry's gone, so too have the apprenticeships and jobs. "No wonder you get young kids hanging out doing whatever," says Day. "We've lost a whole generation."
>
> You can see similar estates and hear similar tales across the country, from the north-west down to the Midlands and the old industrial parts of suburban London. But it's in the north-east, the former home of coal, steel, ships and not a lot else, that you see this unyielding decline at its most concentrated. It's a process I've come to think of as the de-industrial revolution, in which previously productive regions and classes are cast adrift. (The *Guardian*: 15th November 2011)

These conditions have had political consequences, summarized by the *Economist* as follows: ‘Votes for Brexit and for Mr Trump were often cast as an expression of anger at a system that seems rigged. Unless policymakers grapple seriously with the problem of regional inequality, the fury of those voters will only increase.’ (The *Economist*, October 21st 2017: 24) These problems are unlikely to diminish in the short-run, but a part of the long-run solution will only occur if fertility in developing counties reduces to levels found currently in the

developed world. This is likely to happen according to demographic transition theory (Harper 2015), although this raises speculative issues beyond the scope of the present paper.

Bibliography

Broadberry, S., Campbell, B.M.S., Klein, A., Overton, M. and Van Leewen B. 2015 *British Economic Growth, 1270-1870*, Cambridge: C.U.P.

Caldwell J.C. 1986 'Routes to low mortality in poor countries', *Population and Development Review*, 12, 171-220.

Clark G. 2007 'The Long March of History: Farm Wages, Population, and Economic Growth, England 1209-1869', *Economic History Review*, 6 0, 97-135.

Cobbett W. 2001 *Rural Rides*, London: Penguin Classics.

Coleman, T. 2001 *Nelson*, London:

Comfort, N. 2012 *The Slow Death of British Industry*, London: Biteback Publishing Ltd.

Cutler D.M., Deaton A.S. and Llera-Muney A. 2006 'The determinants of mortality' *Journal of Economic Perspectives*, 20, 97-120.

Davies D. 1796 *The Case of Labourers in Husbandry*, Dublin: R. Crutwell.

Easterlin, A. 1999 'How Beneficent is the Market? A Look at the Modern History of Mortality', *European Review of Economic History*, 3, 257-294.

Easterlin R.A. 2012 'Cross-Sections are History', *Population and Development Review*, 38 Supplement.

Gov.Uk Online 2017 *Regional Gross Disposable Household Income*, Office of National Statistics Online; UK House Price Index March 2017.

Habbakuk H.J. 1965 'The Economic History of Modern Britain', in D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography*, London: Edward Arnold.

Harley C.K. 2014 'British and European Industrialization' in L. Neal and J.G. Williamson (eds.), *Capitalism: Volume 1: The Rise of Capitalism from Ancient Origins to 1848*, Cambridge: C.U.P.

Harper S. 2016 How Population Change Will Transform Our World, Oxford: O.U.P.

Howlett J. 1796 *Examination of Mr Pitt's Speech in the House of Commons … February 12th, 1796, Relative to the Condition of the Poor*, London: W. Richardson.

Humphries J. 2010 *Childhood and Child Labour in the British Industrial Revolution*, Cambridge: C.U.P.

Humphries J. 2013"The Lure of Aggregates and the Pitfalls of The Patriarchal Perspective: a Critique of the High Wage Economy Interpretation of the British Industrial Revolution", *Economic History Review*, 66, 693-714.

Keynes, J.M. 2010 *Essays in Biography*, Basingstoke: Palgrave Macmillan.

Keynes, J.M. 2012 *The Collected Writings of John Maynard Keynes, Volume 7,* London: Royal Economic Society.

Lindert, P.H. 2000 'When Did Inequality Rise in Britain and America?', Journal of Income Distribution, 9, 11-25.

Malthus, T.R. 1803 *An Essay on the Principal of Population*, London: J. Johnson.

Malthus, T.R. 1989 *An Essay on the Principal of Population*, Cambridge: C.U.P.

Mayhew H. 1980 *The Morning Chronicle Survey, 6 Volumes*, Firle: Caliban Books.

Mitchell B.R. and Deane P. 1971 *Abstracts of British Historical Statistics*, Cambridge: C.U.P.

Neuman M. 1982 *The Speenhamland County: Poverty and the Poor Law in Berkshire 1782-1834*, London: Taylor and Francis.

Nicolas N.H. 1845 *The Dispatches and Letters of Vice Admiral Lord Viscount Nelson, Volume 1, 1777-94*, London: Henry Colburn.

Phelps-Brown E.H. and Hopkins S.V. 1962 'Seven Centuries of the Prices of Consumables, Compared with Builders' Wage Rates' in E.M. Carus-Wilson (ed.), *Essays in Economic History, Volume 2,* London: Hodder & Stoughton.

Piketty, T. 2014 *Capital in the Twenty-First Century*, London: Harvard University Press.

Preston S.H. 1975 'The Changing Relation Between Mortality and Level of Economic Development', *Population Studies*, 29,231-248.

Razzell P.E. 1990 *William Shakespeare: The Anatomy of an Enigma*, London: Caliban Books.

Razzell, P.E. 1993 'The Growth of Population in Eighteenth-Century England: a Critical Reappraisal', *Journal of Economic History*, 53., 231-248.

Razzell, P.E. 2016 *Mortality, Marriage and Population Growth in England, 1550-1850*, London: Caliban Books.

Razzell P.E. 2017 'Population Growth in Eighteenth Century England', *Unpublished Paper*.

Razzell P.E. and R. Wainwright R. 1973 *The Victorian Working Class*, London: Frank Cass.
Shaw C. 1980 *When I Was a Child*, London: Caliban Books.
Shaw-Taylor L. 2012 'The Rise of Agrarian Capitalism and the Decline of Family Farming' *Economic History Review*, 65: 26-60.
Shepard, A. 2015 *Accounting for Oneself, Worth, Status and the Social Order in Early Modern England*, Oxford: O.U.P.
Smith, A. 1976 *An Inquiry into the Nature and Causes of the Wealth of Nations, Volume 1*, Oxford: O.U.P.
Snell K.D.M. 1985 *Annals of the Labouring Poor,* Cambridge: C.U.P.
Stone L. 1966 'Social Mobility in England, 1500-1700', *Past and Present*, 33, 16-55.
Stone L. 1995 *An Open Elite: England 1540-1880*, Oxford: O.U.P.
Taylor A. 2011 '21 Sad Facts about Deindustrialization of Britain', *Business Insider 18th November 2011.*
Thirsk J. 1967 'The Farming Regions of England' in J. Thirsk, (ed.), *The Agrarian History of England and Wales, 1500-1640*, Cambridge: C.U.P.
Thompson E.P. 1980 T*he Making of the English Working Class*, London: Victor Gollanz.
Whittle J. 2000 *The Development of Agrarian Capitalism: Land and Labour in Norfolk, 1440-1580*, Oxford: O.U.P.
Wrigley E.A. and Schofield R.S. 1981 *The Population History of England & Wales*, London: Edward Arnold.

Malthus: Mortality or Marriage? English Population Growth in the Eighteenth Century.

Peter Razzell

INTRODUCTION

Malthus is the most important influence on thinking about the relationship between economic and demographic development. In his theoretical work, he emphasized the impact of economic factors on fertility and population levels, through shifts in the incidence of marriage. He had been influenced by Adam Smith, who had argued that "the demand for men, like that for any other commodity, necessarily regulates the production of men; quickens it when it goes on too slowly, and stops it when it advances too fast."[1] Malthus's work in turn influenced Ricardo, Marx, Marshall and other classical economists, who all assumed the primacy of economics over demography. The exception was Keynes, who accepted that population affected levels of aggregate demand – he was a strong admirer of Malthus – but had little or nothing to say about the impact of population growth on the supply side, in particular the supply of labour.[2]

Malthus's writings reflected the anxieties of his contemporaries in their concern to prevent a decline in their standard of living and economic privileges. His "preventative" method applied particularly to the middle and upper classes, whereas the "positive" checks were mainly applicable to the poor. Malthus's theory of population stressed the economic basis of marriage and fertility, with a growth in income leading to earlier marriage and a rise in fertility. However, there was a contradiction between his theoretical conclusions and his

[1] A. Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations*, Volume 1, p. 98.

[2] J.M. Keynes, *Essays in Biography (ed.) G. Keynes*), 2010; J.M. Keynes, *The Collected Writings of John Maynard Keynes, Volume 7*, 2012.

analysis of England's population history. Malthus attempted to engage with empirical evidence from parish registers and censuses, but given the unknown reliability of the raw data was forced to make arbitrary assumptions about correction ratios.[3] He also made theoretical statements which may have been correct for the time of writing, but were not accurate for an earlier period. For example, he wrote that "the higher classes ... often want the inclination to marry, from the facility which they can indulge themselves in an illicit intercourse with the sex. And others are deterred from marrying by the idea of the expenses that they must retrench ..."[4] However, in the seventeenth century the aristocracy and other wealthy groups in England married almost universally and at a very young age.[5]

It is possible to construct from his writings on England an account similar to that in a demographic transition model. In this he emphasized the role of mortality rather than fertility in shaping changes in population levels:

> It would appear, by the present proportion of marriages, that the more rapid increase of population, supposed to have taken place since the year 1780, has arisen more from the diminution of deaths than the increase of the births.[6]

He elsewhere amplified this summary statement:

> … there is good reason to believe that not only in London, but the other towns in England, and probably also country villages, were at the time [the 1760s] . . . less healthy than at present. Dr William Heberden remarks that the registers of the ten years from 1759 to 1768, from which Dr Price calculated the probabilities of life in

[3] T. R. Malthus, *An Essay on the Principle of Population*, 1826, pp. 404, 421, 427, 431.
[4] Ibid, p. 397.
[5] See T.H. Hollingsworth, 'The demography of the British peerage', *Population Studies*, Supplement Volume 18, 1965, and data later in this paper.
[6] T. R. Malthus, *An Essay on the Principle of Population*, 1803, p. 311.

> London, indicate a much greater degree of unhealthiness than the registers of late years. And the returns pursuant to the Population Act [of 1801], even after allowing for great omissions in the burials, exhibit in all our provincial towns, and in the country, a degree of healthiness much greater than had before been calculated . . . The returns of the Population Act in 1811 . . . showed . . . a greatly improved healthiness of the people, notwithstanding the increase of the towns and the increased proportion of the population engaged in manufacturing employments.[7]

He concluded that disease environment played a critical role in shaping mortality levels: "A married pair with the best constitutions, who lead the most regular and quiet life, seldom find that their children enjoy the same health in towns as in the country."[8]

Malthus in his writings gave a sociological rather than an economic analysis of marriage: "It is not . . . among the higher ranks of society, that we have most reason to apprehend the too great frequency of marriage . . . [it is] squalid poverty . . . [which] prompt universally to early marriages . . ."[9] He argued that the "carelessness and want of frugality observable among the poor, so contrary to the disposition generally to be remarked among petty tradesmen and small farmers,"[10] and that

> poverty itself, which appears to be the great spur to industry, when it has once passed certain limits, almost ceases to operate. The indigence which is hopeless destroys all vigorous exertion … It is the hope of bettering our condition, and the fear of want, rather than want itself, that is the best stimulus to industry, and its' most constant and best directed efforts will almost invariably be found among a class of people above the class of the wretchedly poor.[11]

---

[7] T. R. Malthus, *An Essay on the Principle of Population*, 1989, Volume 1, pp. 256, 267..
[8] Ibid, p. 257.
[9] Ibid, p. 438; Volume 2, pp. 114, 150.
[10] Ibid, Volume 1, p. 359.
[11] Ibid, p. 439.

It was this emphasis on "bettering our condition" that led Malthus to stress education as the best way of encouraging the postponement of marriage:

> . . . to better the condition of the lower classes of society, our object should be to . . . [cultivate] a spirit of independence, a decent pride, and a taste for cleanliness and comfort among the poor. These habits would be best inculcated by a system of general education and, when strongly fixed, would be the most powerful means of preventing their marrying . . . [and] consequently raise them nearer to the middle classes of society.[12]

Malthus is expressing here the insight which has informed much of the literature on modern birth control practices: that education − particularly of women − combined with economic opportunity, is the most powerful way of encouraging fertility reduction.

His conclusion was that falling mortality had led to a reduction in the incidence of marriage:

> … the gradual diminution and almost total extinction of the plagues which so frequently visited Europe, in the seventeenth and the beginning of the eighteenth centuries, produced a change [in the incidence of marriage] … in this country [England] it is not to be doubted that the proportion of marriages has become smaller since the improvement of our towns, the less frequent returns of epidemics, and the adoption of habits of greater cleanliness.[13]

This was an early form of demographic transition theory, and in order to evaluate this argument, it is necessary to examine in detail England's demographic history in the eighteenth century.

---

[12] Ibid, Volume 2, p. 155.

[13] Ibid, Volume 2, p. 198. See also Ibid, Volume. 1, p.193 and Volume 2, p.115.

THE RELIABILITY OF PARISH REGISTERS

There is an element of uncertainty in all historical demographic measures, including local and regional variations. In the absence of reliable national data, it is necessary to adopt a methodology of the triangulation of data. This allows independent checking of all findings, important where these findings are unexpected and potentially controversial. An example of this is the finding that virtually all women were married in England during the seventeenth century, contradicting the theoretical notion of a European marriage pattern.[14] This conclusion was reached by using five different sources – censuses, church court depositions, burial registers, wills and family genealogies.[15] Likewise, the finding of the halving of adult mortality in the eighteenth century is based on the analysis of apprenticeship indentures, marriage registers, family genealogies, and data on elite groups such as Members of Parliament.[16]

The same methodological principle applies to the measurement of parish register reliability. Central to all discussion of population history before the introduction of civil registration in 1837 is the reliability of parish registers. Nine objective methods measuring burial register reliability are available, involving the triangulation of data.[17] The most important two methods are: (i) the same-name technique and (ii) the comparison of individual entries in probate and burial registers.

The same-name technique is based on a custom in England which gave the name of a dead child to a subsequent child of the same sex. Evidence from local censuses and other listings suggests that there were no living children with the same names in

[14] J. Hajnal, 'European marriage patterns in perspective' in D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography,* 1965, p. 101.

[15] P.E. Razzell, *Mortality, Marriage and Population Growth in England, 1550-1850*, 2016, pp. 60-70,

[16] Ibid, pp. 45-60.

[17] Ibid, pp. 15, 16.

individual families in the period 1676-1849.[18] However, according to probate data for different parts of England during the period 1600-1649 there were thirteen living same-name children out of a total of 2,144 – 0.6 per cent – although some of these children may have been step-siblings.[19]

Where two children of the same family were baptised with an identical name, it is therefore possible to measure the completeness of burial registration by searching for the first same-name child in the burial register. The technique can only be applied to families with at least two recorded baptisms of children of the same sex, but it is a valuable method of assessing the quality of burial registration.

The most important work on England's demographic history using parish registers is that carried out by E.A Wrigley and colleagues of the Cambridge Group. Their main findings were that after a period of stagnation in the second half of the seventeenth and first half of the eighteenth century, population began to grow rapidly after the middle of the eighteenth century, with about two-thirds of the population increase due to a rise in fertility, and one

[18] Galley, Garrett, Davies and Reid initially argued that there were some living same-name English children enumerated in the 1695 Marriage Duty Census, but subsequently conceded that these same-name siblings were a consequence of transcription errors. C. Galley, E. Garrett, R. Davies and A. Reid, 'Living same-name siblings and English historical demography: a final comment', *Local Population* Studies, Number 88, 2012, p.82. See also C. Galley, E. Garrett, R. Davies, A. Reid, 'Living same-name siblings and English historical demography: a reply to Peter Razzell', *Local Population Studies*, Number 87, 2011; P.E. Razzell, 'Living same-name siblings in England, 1439-1851, *Local Population* Studies, Number 87, 2011; P.E. Razzell, 'Living same-name siblings in England, 1439-1851: a commentary, *Local Population* Studies, Number 88, 2012. Galley et.al successfully established that there were some living same-name children in Highland Scotland at this time, but all the research reviewed in this paper relates to English demographic experience.

[19] See P.E. Razzell, 'Living same-name siblings in England, 1439-1851, *Local Population* Studies, Number 87, 2011, p. 67 for a list of the places and dates involved.

third to decreasing mortality.[20] They have argued that the growth of population was mainly the result of the increase in fertility associated with a fall in the age of marriage, which in turn was due to growing real incomes lagged over time, a conclusion largely confirming the theoretical work of Malthus.

Because of deficiencies in parish registration, it was necessary to inflate the number of burials, baptisms, and marriages in order to establish reliable measures of deaths, births, and marriages. During the period in which the Cambridge Group's research was carried out there were no methods available to independently measure the reliability of inflation ratios. This was recognized by Wrigley et.al when they concluded that "the lack of a reliable alternative data source makes it impossible . . . to test effectively the completeness of Anglican registration", resulting in "arbitrary" inflation ratios which can only be based on "internal plausibility and internal consistency of the results obtained."[21]

However there are now available new objective methods of measuring parish register reliability. The following table summarizes a same-name analysis of 15 Cambridge Group reconstitution parishes during the period 1650-1837.

Table 1: Proportion of Untraced Same-Name Cases in 15 Cambridge Group Reconstitution Parishes, 1650-1837.[22]

Period	*Total Number of Same-Name Cases*	*Number of Same-Name Cases Traced in Burial Registers*	*Proportion of Untraced Cases*
1650-99	1,160	873	24.7%
1700-49	1,533	1,246	18.7%
1750-99	1,227	903	26.4%
1800-37	907	705	22.3%

[20] E.A. Wrigley, R.S. Davies, J.E. Oeppen, R.S. Schofield, *English Population History from Family Reconstitution, 1580-1837*, 1997, p. 126.

[21] E.A . Wrigley, R.S. Schofield, *The Population History of England, 1541-1871*, 1989, p. 137; Wrigley, Davies, Oeppen, Schofield, *English Population*, pp. 91, 92.

[22] Source: Reconstitution data in Cambridge Group archive.

There appears to have been a slight improvement in burial registration reliability in the first half of the eighteenth century, although other data suggests no significant change in the period between 1650 and 1837.[23]

Research comparing probate with burial register data covering 147 parishes indicates that there were no significant changes in burial registration reliability in the parish register period.[24] The most detailed research available is on the county of Bedfordshire, where a study of all 124 parishes has been carried out.

Table 2: Proportion of Probate Cases Traced in 124 Bedfordshire Burial Registers, 1543-1849.[25]

Period of Probate	*Total Number of Probate Cases*	*Proportion of Burials Untraced*
1543-99	610	26%
1600-49	3731	21%
1650-99	4626	26%
1700-49	6030	23%
1750-99	3744	22%
1800-49	3303	27%
Total	22044	24%

Using digital data transcribed by the Bedfordshire Family History Society, it is possible to calculate same-name untraced cases for 87 parishes for the period 1580-1849. There were 91 untraced cases out of a total of 307 – 30% - indicating that the untraced cases in

[23] Razzell, *Mortality*, pp. 18-23.

[24] Probate data tends to exclude the poorest members of a community, but data for Bedfordshire suggests that the poorest occupational group – labourers – experienced similar levels of burial under-registration as the rest of the population. P.E. Razzell, C. Spence, M. Woollard, 'The evaluation of Bedfordshire burial registration, *Local Population* Studies, Number 84, 2010, p. 45.

[25] Source, Razzell, *Mortality*, p. 18.

Table 2 yield a somewhat conservative figure of missing burials in the parish register period.[26]

Wrigley and Schofield had assumed in their aggregative research that other than defective periods, burial registration was perfect in the period leading up to the middle of the seventeenth century and only deteriorated significantly at the end of the eighteenth century.[27] This is reflected in the inflation ratios they used to translate burials into deaths which were as follows: 1540-99: 0%; 1600-49: 0%; 1650-99: 1.9%; 1700-49: 4.6%; 1750-99: 10.0%: 1800-39: 25.8%.[28] Data on same-name and probate/burial register research, indicates that at least 25% of all burials were missing from parish registers in the period 1600-1837, with no clear linear trends in register reliability over time.

The absence of significant changes in burial register reliability is similar to the findings of research on baptism register reliability. This involved research comparing information in censuses and baptism registers, including an evaluation of the quality of the census data through cross-matching censuses at different dates.[29] There was no linear trend found in the eighteenth century, with about 29 per cent of all births missing from the baptisms registers.[30]

Wrigley and Schofield's inflation ratios for baptisms in the period 1710-1836 are as follows: 1710-42: 11.5%; 1743-62: 13.9%; 1763-80: 16.4%; 1781-1800: 26.0%; 1801-20: 42.9%; 1821-36: 39.1%.[31] They assumed that birth under-registration was relatively

---

[26] I would like to thank the Bedfordshire Family History Society for providing CDs of the baptisms and burials for the whole county. The breakdown of the figures of untraced cases by half-century, with the total number of cases in brackets, was as follows: 1580-1648 :44% (39); 1652-99:32% (76); 1700-49: 24% (83);1750-99: 32% (65); 1801-49: 20% (44). The sample sizes are too small to make a meaningful comparison with the figures in Table 2.

[27] Wrigley, Schofield, *The Population*, p. 561.

[28] Ibid.

[29] P. E. Razzell, *Essays in English Population History*, 1994, pp. 84-89.

[30] Razzell, *Mortality*, pp. 22, 23.

[31] Wrigley, Schofield, *The Population*., pp. 541-44.

low in the period 1710-80, but deteriorated sharply from the 1780s onwards, particularly after 1801. This assumed pattern is at variance with the findings outlined above, which essentially show no major changes in the eighteenth and early nineteenth century.

There is also evidence of a high level of marriage under-registration which is confirmed by Baker in his study of eighteenth century Cardington in Bedfordshire. He with colleagues attempted to trace both native and other adults who had migrated from all parts of the county, and found that 40.1% of baptisms, 31.5% of marriages and 24.9% of burials could not be traced in parish registers.[32] According to a range of evidence, this non-registration of births, marriages and deaths was mainly due to the negligence of clergyman and clerks in compiling parish registers.[33]

Wrigley and colleagues attempted to address the problems of parish register reliability by constructing a complex mathematical back projection model. The model suffers from a range of arbitrary assumptions, including the sharp inflation of baptisms and burials at the end of the eighteenth and beginning of the nineteenth century. Additionally, these models are very sensitive to changes in assumption. For example, as a part of their back projection programme, Wrigley and Schofield reduced the size of the age group 90-94 enumerated in the 1871 Census by 44%; if they had chosen instead to reduce this by 40%, their estimate of the English population in 1541 would have been 9% larger.[34]

ESTIMATES OF POPULATION GROWTH

Given that there were no major changes in parish register unreliability in the parish register period, the most valuable data created by the Cambridge Group are the raw uncorrected national

[3232] D. Baker, *The Inhabitants of Cardington*, 1973, p. 18.
[33] Razzell, *Essays*, pp. 108-11.
[34] R. Lee and D. Lam, 'Age distribution adjustments for English censuses, 1821 to 1931', *Population Studies*, Volume 37, 1983, p. 446.

figures of baptisms, marriages and burials. These raw national figures provide the basis for the calculation of population changes in the eighteenth century, but with the assumption of zero net migration. For the purposes of this analysis, it is assumed that 29% of births and 28% of deaths went unregistered in the eighteenth century.[35] These figures are used as correction factors because they yield appropriate population growth figures in the eighteenth century between the 1695 marriage duty census and the first national census of 1801. Applying these correction ratios to the raw national data yields the following population figures.

Table 3: Estimated Population Sizes of England, 1695-1801.[36]

	Births	*Deaths*			
Period	*Baptisms x 100/71*	*Burials x 100/72*	*Births Minus Deaths*	*Population Date*	*Population Size*
				1695	4632000
1695-99	1029677	951322	78355	1700	4710355
1700-09	2100998	1840774	260224	1710	4970579
1710-19	2079920	1922863	157057	1720	5127636
1720-29	2225579	2349728	-124149	1730	5003487
1730-39	2402912	2094161	308751	1740	5312238
1740-49	2306889	2151421	155468	1750	5467706
1750-59	2437382	1999636	437746	1760	5905452

[35] These proportions are based on figures discussed previously, with about twenty-nine per cent of births missing from baptism registers in the eighteenth century. Approximately twenty-five per cent of deaths in same-name and probate parish samples were untraced in the period 1650-1837, but the number of untraced cases in urban areas appears to have been higher. For example the proportion of untraced cases in London and Liverpool in the period 1700-49 was significantly higher than elsewhere in the parish register period. P.E. Razzell, *Population and Disease: Transforming English Society, 1550-1850*, 2007, pp.134, 138.

[36] Source: Wrigley, Schofield, *The Population*, pp. 517-52, 577, 588. The population in the start date in 1695 is based on David Glass's reworking of Gregory King's estimate of population at that date.

1760-69	2607904	2280840	327064	1770	6232516
1770-79	2903273	2247785	655488	1780	6839889
1780-89	3085997	2478624	607373	1790	7447262
1790-99	3414119	2466510	947609	1800	8394871
1800-01	631897	528639	103258	1801	8498129

The estimated population figure for 1801 – 8,498,129 – is slightly smaller than the figure that Rickman calculated for 1801 – 8.561 million.[37] Given that the above estimates do not make any allowance for changes in migration levels, and that the population figure for 1695 is somewhat arbitrary, the data in Table 3 represent a plausible pattern of population growth in the eighteenth century.

The Table indicates that population diminished in the 1720s but increased gradually after that period, accelerating rapidly at the end of the eighteenth and beginning of the nineteenth century. The raw data suggests that it was a fall in mortality rather than a rise in fertility that was responsible for the increase in population.

Table 4: English Baptism and Burial Rates (Per 1000) in England Calculated from Cambridge Group Data.[38]

Period	*Estimated Population*	*Baptism Rate*	*Burial Rate*
1701-40	5,160,000 (1721)	30.4	28.7
1741-80	6,054,000 (1761)	30.3	25.9
1781-1820	8,667,000 (1801)	29.4	20.6

It is only because Wrigley & Schofield disproportionately inflated the number of baptisms in the period 1781-1820 that they concluded that there was a rise in the crude baptism rate in this period, and yet as we have seen the direct evidence on baptism

[37] Ibid, p. 577.

[38] Source: Baptism and burial totals Wrigley, Schofield, *The Population*, pp. 541-44, 549-52; population figures taken from Table 3.

registration reliability suggests that there were no significant changes in this period. Gregory King's work on the age structure of the English population in 1695 indicates it was very similar to that in 1821 based on national enumeration returns,[39] suggesting that there was no long-term change in age-specific fertility during this period.

Table 4 indicates that it was falling mortality that fuelled population growth, but in order to further clarify the exact demographic changes in the eighteenth century, it is necessary to consider in detail the empirical evidence on mortality, nuptiality and fertility in the parish register period.

THE HISTORY OF INFANT AND CHILD MORTALITY

Most studies of infant and child mortality have suffered from the lack of an objective method of measuring burial registration reliability.[40] The same-name method allows objective measurement, stating its procedures in advance and not making adjustments to resulting findings. I have used the technique for the analysis of 11 Cambridge reconstitution parishes, as well as in 15 rural parishes from other areas of England. [41]

---

[39] D.V. Glass and D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography*, 1965, pp. 212-13.

[40] There are a number of historical studies of infant and child mortality which suffer from this difficulty. See R.E. Jones, 'Further evidence on the decline of infant mortality in pre-industrial England: north Shropshire, 1561-1810', *Population* Studies, Volume 34,, 1980, pp. 239-50; J. Landers, 'London mortality in the long eighteenth century', *Medical History, Supplement Number 7*, 1991; R. Houston, 'Mortality in early modern Scotland: the life expectancy of advocates', *Continuity and* Change, Volume 7, 1992; P. Huck, 'Infant mortality in nine industrial parishes in northern England, 1813-36', *Population* Studies, Volume 48, 1994; M. Dobson, *Contours of Death and Disease in Early Modern* England, 1997; C. Galley, *The Demography of Early Modern Towns; York in the Sixteenth and Seventeenth* Centuries, 1998.

[41] Source: Reconstitution data in the Cambridge Group archive; parish registers in the Society of Genealogists library. Same-name correction ratios

Table 5: Infant and Child (1-4) Mortality (per 1000) in 11 Cambridge Group and 15 Rural Parishes, 1700-1837.

Period	*Number of Infants at Risk*	*Number of Children at Risk*	*IMR*	*CMR*
11 Cambridge Group Parishes				
1700-49	11933	8842	174	110
1750-99	12591	9897	148	97
1800-37	15362	9230	110	99/
15Rural Parishes				
1700-49	8332	5603	182	128
1750-99	9629	6950	150	126
1800-37	9375	6183	94	81

The pattern of mortality in the two samples is similar, although the reductions in mortality between 1700-49 and 1800-37 are greater in the rural areas than in the Cambridge Group sample. This may be partly a function of population size, as the mean population in 1801 of the Cambridge Group parishes was 1,349 and that of the rural sample 589. The average national mean size of the English population in 1801 was about 860,[42] and so the rural parishes are slightly more representative than the Cambridge Group ones.

From research on birth-baptism intervals and infant mortality, it is estimated that a maximum of 5% of children died before baptism in the period 1761-1834. However, many 'sickly' children were privately baptised, reducing mortality before baptism.[43] The infant mortality rates in both samples in 1800-37

---

have been applied to raw IMR and CMR figures. The 11 Cambridge Group parishes are: Alcester; Aldenham; Austrey; Banbury; Bottesford; Colyton; Dawlish; Great Oakley; Ippleden; Morchard Bishop. The 15 rural parishes are: Ackworth; Ampthill; Arrington; Barton-in-the-Clay; Beeley; Breamore; Canewden; Cusop; Eaton Hastings; Kemerton; Sandy; Stow Maries; Truro; Weston Colville; Woodchurch; Youlgreave.

[42] Wrigley, Davies, Oeppen , Schofield, *English Population*, p. 20

[43] Razzell, *Essays,* pp. 106-07.

were relatively low – 110/1000 and 94/1000 – and this may be partly a function of the exclusion of infants dying before baptism. Woods estimated that the infant mortality rate in rural areas during the Victorian period was 97 per 1,000 as against 218 per 1,000 in urban areas, with a national average of 150 per 1,000.[44] He calculated the rural rate from data for Dorset, Hertfordshire and Wiltshire, southern counties like those forming the basis of the samples in Table 5. Similar consideration are likely to apply to child mortality rates, for although the child mortality rate for the age group 1-4 nationally in 1838-54 was 134 per 1,000,[45] it is likely to have been significantly less of that in rural areas, similar to that depicted in Table 5.

However, the sample sizes are small and are not necessarily representative of the whole country. They do not include any northern parishes or large towns, and under-represent industrial villages.[46] Infant and child mortality was much higher in large towns than in rural and provincial parishes in the seventeenth and eighteenth centuries. The infant and child mortality rates in 18 rural reconstitution parishes in 1650-1699 were 151/1000 and 106/1000 respectively; the equivalent rates in London, Norwich, Ipswich and Canterbury in a similar period were 304/1000 and 237/1000.[47] Urban infant and child mortality was twice of that in rural and provincial parishes in the late seventeenth century, but by the nineteenth century the average infant mortality rate in these urban areas had reduced to 179 per 1000.[48] However, there is some evidence to indicate that infant mortality grew in some urban and industrial parishes in the first

[44] Woods, op. cit., pp. 260-61.
[45] Register General Supplement, *45th Annual Report*, p. v
[46] A reconstitution study of Ackworth in Yorkshire for the period 1687-1812 indicates that the pattern of infant and child mortality was similar to that in Table 5, although at a somewhat lower level. The figures are as follows: 1687-1749: IMR: 166, CMR: 114; 1750-1812: IMR: 82, CMR: 77. Razzell, *Mortality,* p.34.
[47] Ibid, p. 34.
[48] Ibid.

half of the nineteenth century,[49] although the scale of reductions during the eighteenth century in the four urban parishes greatly outweighed the relatively modest increases in urban areas in the nineteenth century.

The pattern of infant and child mortality in the most important urban area – London – is indicated by the results of reconstitution studies of 16 City of London parishes in the period 1539-1849.

Table 6: Infant and Child (1-4) Mortality (Per 1000) in 16 London Parishes, 1650-1849.[50]

Period	*IMR*	*CMR*
1650-99	256	282
1700-49	409	176
1750-99	263	270
1800-49	141	118

Infant mortality increased significantly between 1650-99 and 1700-49, before falling very sharply after the middle of the eighteenth century. There was a similar pattern in child mortality, except for the rise in mortality in the second half of the eighteenth century.

SOCIO-ECONMIC STATUS AND INFANT AND CHILD MORTALITY

[49] W.A. Armstrong, 'The end of mortality in Carlisle between the 1780s and the 1840s: a demographic contribution to the standard of living debate', *Economic History Review*, Volume 34, 1981; P. Huck, 'Infant mortality in nine industrial parishes in northern England, 1813-36', *Population Studies,* Volume 48, 1994*;* S. Szreter, G. Mooney, 'Urbanization, mortality and the standard of living debate: new estimates of the expectation of life at birth in nineteenth century British cities', *Economic History Review*, Volume 51, 1998.

[50] Source: Razzell, *Population*, pp, 13, 134.

One further way of exploring the factors shaping infant and child mortality is to analyse the relationship between socio-economic status and mortality.

Table 7: Infant and Child (1-4) Mortality (Per 1,000) amongst Elite and Control Families in 17 Cambridge Group Parishes, 1650-1799.[51]

Period	*Elite Families*		*Control Families*	
	IMR	CMR	IMR	CMR
1650-99	158	143	180	132
1700-49	177	106	223	146
1750-99	113	69	159	134

An elite family – gentlemen, professionals and merchants – was matched with the next control family in the baptism register, most of whom were artisans and labourers. There was little difference between the two groups in the late seventeenth century, but a sharp divergence thereafter, particularly in child mortality rates. Other sources indicate a variation in findings, although overall it would appear that these forms of early mortality reduced first amongst wealthy families and only later amongst the general population in the eighteenth century.[52] Lower infant and child mortality levels amongst the wealthy continued throughout the nineteenth century,[53] although at significantly reduced levels than in the seventeenth century. However, areas with different socio-economic profiles showed if everything a reverse pattern. This can be illustrated with reference to London, where the Registrar-General provided data on mortality by registration sub-district. He classified districts by poverty levels as measured by average rateable value.

---

[51] Source: Razzell, *Mortality*, p. 37.

[52] Razzell, *Population,* pp. 91, 103-05, 111,-12; 133; Razzell, *Mortality,* pp. 37-41.

[53] Razzell, *Population,* pp. 112-14.

Table 8: Infant, Child and Adult Mortality per 1000 in London by Rateable Value of Registration District, 1839-44.[54]

Registration Districts	*Mean Annual Value of Rated Property*	*IMR*	*CMR*	*Adult (25-44) Male Mortality*
10 districts with lowest rateable value	£15	153	52	13
10 districts with medium rateable value	£26	168	59	15
10 districts with highest rateable value	£58	167	58	13

Most of the poor districts were in the East End of London, and the wealthy ones in the West End.[55] The lack of an association between socio-economic status and infant mortality is supported by evidence on Quakers, who by the nineteenth century were mainly wealthy merchants and professionals. The infant mortality rate amongst Quakers in London in 1825-49 was 150 per 1000, similar to the rate amongst the total population in equivalent registration districts in 1838-44.[56]

These surprising findings are replicated in other districts of England. In the period 1851-60, mortality levels in the wealthy towns of Bath, Cheltenham, Richmond and Brighton were significantly higher than in poorer districts in the same county.[57] The wealthy areas were towns, and the poorer areas rural districts, indicating that disease environment was more important in these instances than poverty in shaping mortality levels.[58]

To summarize, in rural and provincial areas infant mortally fell sharply between the first half of the eighteenth and nineteenth centuries, nearly halving in some areas. Child mortality in these districts was more stable, although there

[54] Source: Ibid, p. 136.
[55] Source: Ibid, p. 136.
[56] Razzell, *Population*, p. 137; Landers, op. cit.
[57] Razzell, *Mortality*, p. 41
[58] See Woods *The Demography*, pp. 170-202 for an analysis of the mortality differences between urban and rural districts in this period.

appears to have been a significant fall in some rural areas at the beginning of the nineteenth century. In London and in other urban districts there were marked falls in both infant and child mortality. Child mortality amongst the wealthy reduced in rural and provincial areas at an earlier period – from the beginning of the eighteenth century onwards – than it did among the general population.

It is less clear what the influence of socio-economic status was on urban infant and child mortality, and in London by the mid-nineteenth century there appears to have been little or no association between poverty and these forms of mortality. Also, as we have seen, in a number of provincial districts mortality was significantly lower in poor than in wealthy areas in the 1850s.

The general timing and extent of reductions in early childhood mortality cannot fully explain the scale of population increase in the eighteenth century. For a full explanation of this surge in population growth we must look elsewhere.

THE HISTORY OF ADULT MORTALITY

There are a number of problems with the reconstitution study of adult mortality, in particular the unreliability of raw burial registration data. Only about ten per cent of the original sample can be included in the analysis, which is not likely to be socially or demographically representative of the total population.[59] There is also the difficulty of establishing accurate nominal record linkages between baptisms/marriages and subsequent burials, as most parish registers only list the names of people buried without further identifying information. There are however a number of sources which allow the direct measurement of adult mortality, the most important of which are: i. apprenticeship indenture records, and ii. marriage licences.

[59] Razzell, *Mortality,* p. 43

In the year 1710 the government introduced a national tax on apprenticeship indentures – the Inland Revenue Register (INR Register) – which was in existence until the early nineteenth century. Details of these indentures have survived and are currently being digitised by the Society of Genealogists.[60] The indentures in the early period provide the following information on fathers: name, place of residence, occupation, and whether or not they were alive or dead. Additionally the name of the apprentice was recorded along with the amount paid for the indenture.

A sample of 1,578 cases was selected from the national register, and data on the mortality status of fathers was established. It is estimated that a minimal annual mortality rate for England in 1710-13 was 20.9 per 1,000, which can be compared to figures published by the Registrar-General for a similar age group – 25-44 – in the period 1838-42 – 11 per 1000.[61] This indicates that male adult mortality approximately halved in the period between the early eighteenth and middle of the nineteenth century, a conclusion borne out by a number of other sources.[62]

Marriage licences are one of the most informative sources, covering between 30 and 90 per cent of the population.[63] For children under the age of 21, they required parental permission, and where a father was dead, permission of a widowed mother or guardian was required. The licences are available from the beginning of the seventeenth to the end of the eighteenth century, and an analysis of available licences yields the following results:

---

[60] I would like to thank the Society of Genealogists for making available the digital version of the INR Register, covering the surnames beginning with the letters A to M.

[61] Mitchell and Deane, *Abstracts*., p. 38

[62] Razzell, *Mortality,* pp. 45-56.

[63] Razzell, *Population,* pp. 62, 63

Table 9: Fathers of Spinsters under Twenty-One: Proportions Dead in English Regions, 1600-1799.[64]

Period of marriage	*London*	*South of England*	*East Kent Diocese*	*Durham Diocese*
1600-46	46%	40%	47%	-
1661-99	47%	44%	43%	-
1700-09	48%	47%	50%	-
1710-19	47%	44%	48%	-
1720-29	45%	39%	48%	-
1730-39	46%	39%	34%	-
1740-49	55%	45%	37%	42%
1750-59	40%	41%	27%	28%
1760-69	35%	35%	22%	27%
1770-79	39%	31%	24%	29%
1780-89	31%	32%	28%	25%
1790-99	31%	27%	22%	-

According to this table, male adult mortality nearly halved in all regions in the eighteenth century.[65] As the figures relate to fathers who were alive on average nineteen years before the marriage of their daughters, mortality first began to fall in East Kent between 1710 and 1730, and in London, the South of England and Durham between 1730 and 1750.

According to Table 9 there were gains in life expectancy throughout the whole of the eighteenth century, although in East Kent most of this took place in the first half of the century. Other evidence indicates that reductions of mortality in Nottinghamshire also appear to have occurred mainly in this period, with the estimated paternal death rate falling from 22 per 1,000 in 1661-63 to 14 per 1,000 in 1754-58 and 10 per 1,000 in 1791-93.[66]

---

[64] Source: Razzell, *Mortality,* p. 48.
[65] Ibid.
[66] Ibid, p. 49.

However data on the fathers of masons' apprentices who lived in all areas of the country, suggests paternal mortality fell progressively throughout the eighteenth century.

Table 10: Mortality Amongst Fathers Of London Indentured Masons' Apprentices.[67]

	Fathers Residing In London			Fathers Residing Out Of London		
Period	Number Of Fathers	Number Of Fathers Dead	Proportion Of Fathers Dead	Number Of Fathers	Number Of Fathers Dead	Proportion Of Fathers Dead
1663-99	223	94	42.2%	450	167	37.1%
1700-49	375	124	33.1%	250	76	30.4%
1750-99	202	43	21.3%	96	18	18.8%

Most of these fathers were artisans and tradesmen, and overall lived equally in and outside of London, with many of the latter residing in every county and country of Great Britain. Mortality was slightly higher in London than in areas outside the capital, but the pattern of falling mortality was nearly identical in the two regions, suggesting that disease environment was not critical in the reduction of mortality.

Evidence from the marriage licences and apprenticeship indentures suggest that adult mortality was higher amongst the wealthy than the poor, and this may have been the case until the end of the nineteenth century.[68] This was probably due to the 'hazards of wealth' – the consumption of very rich food and alcoholic drinks, and a relative lack of exercise – as well as the result of avoiding childhood infections such as smallpox, which took their toll in adulthood.[69]

However, this reverse socio-economic gradient appears to have been established in the eighteenth century, as revealed by the association between occupation and mortality in East Kent during the period between 1619-46 and 1751-1809.

---

[67] Source: C. Webb, *London Livery Company Registers, Volume 27: Masons Company, 1663-1805.* (1999).
[68] Razzell, *Population,* pp. 197-226.
[69] J.C. Riley, *The Eighteenth Century Campaign to Avoid Disease*, 1987.

Table 11: Proportion of Dead Fathers of Spinsters Marrying Under 21, by Occupation of Husband in East Kent, 1619-1809.[70]

Occupation	*Period*		
	1619-46	*1661-1700*	*1751-1809*
Gentlemen, Merchants & Professionals	39%	38%	28%
Yeomen & Farmers	41%	42%	15%
Tradesmen & Artisans	46%	49%	26%
Husbandmen	50%	39%	19%
Mariners & Fishermen	42%	45%	24%

Mortality declined significantly during the eighteenth century, approximately halving in most occupational groups. In the seventeenth century gentlemen, merchants and professionals appear to have lower mortality than other groups, but by 1751-1809 the position had been reversed, with this elite group having the smallest reduction in mortality.

These conditions and practices inevitably led to a high incidence of disease and levels of mortality, in spite of the wealth of these privileged populations. There is now evidence that mortality levels of the wealthy were very high in the earlier period, but changed significantly during the eighteenth century. Perhaps the best illustration of this is the changing life expectancy of Members of Parliament during this period. The data is of a very high quality, with about 95 per cent of information on birth and death dates during the period 1660-

[70] Source: Razzell, *Essays,* p. 197. For higher paternal mortality amongst gentlemen and professionals than in other groups in Nottinghamshire and Sussex during 1754-1800 see Razzell, *Population*, p. 117.

1820.[71] Members of Parliament came from all areas of the country, and their socio-economic status as owners of estates did not change during the period covered by the following table.[72]

Table 12: Mean Number of Years Lived by Members of Parliament, 1660-1820 (Number of Cases in Brackets).[73]

Period of First Entry	*Age at First Entry*		
	29 Years and Under	*30-39 Years*	*40 Years Plus*
1660-1690	25.7 (429)	22.6 (458)	17.9 (633)
1691-1714	28.1 (520)	25.4 (402)	18.3 (438)
1715-1754	30.8 (541)	28.2 (422)	18.5 (347)
1755-1789	37.1 (480)	29.9 (354)	21.2 (431)
1790-1820	38.1 (571)	32.0 (432)	22.4 (572)

All age groups experienced mortality reductions, but the greatest mortality gains were amongst the youngest age cohort aged 29 and under. There was an increase in life expectancy of over 12 years in this group, distributed evenly in the entry period between 1660 and 1789. There were also substantial gains in the 30-39 age cohort – of about 10 years – but these were mainly confined to the entry period between 1660 and 1754. There was a modest increase in life expectancy of nearly 5 years in the oldest 40+ group, which was fairly evenly spread between 1660 and 1820. The above pattern of adult mortality is similar to that found by Hollingsworth in his study of the aristocracy.[74] Although all the evidence considered on adult mortality is for males, his study of

[71] See the online History of Parliament website.
[72] Ibid.
[73] P. Razzell, *Essays in Historical Sociology*, 2021, p. 169. Table 12 also has extra information on the 1691-1714 cohort.
[74] Hollingsworth, *The Demography*, p. 56

the aristocracy suggests that females experienced even more mortality reductions in the eighteenth century.[75]

The timing of the reduction in adult mortality was different from the falls in infant and child mortality which appear to have occurred mainly in the second half of the eighteenth century, and given that life table models assume that infant/child and adult mortality move in the same direction, this suggests that these models are not a reliable basis for understanding eighteenth century mortality trends. The Cambridge Group have used such models in calculating figures of adult mortality, but different assumptions may have been one of the reasons why their figures have changed significantly in recent years. In 1997 Wrigley et.al published life expectancy figures for men aged twenty-five as follows: 1640-89: 30.4 years; 1750-1809: 35.4 years.[76]

More recently in 2004, Wrigley has claimed that 'reconstitution data suggest that adult mortality moved from the equivalent of level 5 in model North in the period 1640-89 to the equivalent of level 9 in 1750-1809, or a rise of 10 years.'[77] The latter figure represents a very significant increase over earlier estimates, and is now compatible with the marriage licence and other data reviewed earlier.[78] Wrigley concluded that 'there seems little reason to suppose that the evidence relating to male adult mortality drawn from marriage licences and that drawn from reconstitution are at odds'[79], representing a welcome new consensus.

EXPLAINING MORTALITY REDUCTIONS

[75] Ibid, p. 57.
[76] Wrigley, Davies, Oeppen, Schofield, op. cit., p. 291.
[77] E.A. Wrigley, *Poverty, Progress and Population*, 2004, pp. 427, 428
[78] According to calculations prepared by Jim Oeppen using the East Kent marriage licence data, there was an increase of 9 years in life expectancy at age 25 between 1650-99 and 1750-1800. Razzell, *Essays*, p. 201.
[79] Wrigley *Poverty*., p. 431.

The factors responsible for mortality levels are complex. For example, smallpox became much more virulent between the sixteenth and nineteenth century: case fatality rates amongst unprotected children in London rose from about 5% to 45% in this three hundred year period. It is possible that the increasing fatality of smallpox was the result of the importation of more virulent strains with the growth of world trade. It was only the practice of inoculation and vaccination that prevented the disease from destroying a large part of the population.[80] Smallpox also varied in its age incidence between different areas of the country: in the South of England it was a disease of both adults and children, whereas in the North and elsewhere it affected mainly young children. This is important as case-fatality rates differed markedly between different age groups.[81]

To some extent, disease had its own internal logic, so that for example the disappearance of the plague in England in the 1660s does not appear to be the result of any environmental or other improvements. However, it is known that environmental factors did influence the incidence of disease. Mortality was higher in marshland areas, in industrial and urban districts, in certain coastal and estuarine regions, and lower in isolated rural areas with the right geographical and ecological characteristics.[82]

It is possible that the lower levels of infant mortality amongst the wealthier socio-economic groups in Table 7 are partly a function of wealth, although falling elite mortality in the second half of the eighteenth century suggests that non-economic factors were responsible.[83] The rapid fall in child mortality in elite families in the eighteenth century, at a time when it was stable amongst the control population, indicates that this reduction of mortality was exogenous to economic development.

---

[80] P. E. Razzell, *The Conquest of Smallpox*, 2003.

[81] Ibid, pp. xi-xix.

[82] Dobson, *Contours*.; Razzell, *Population,* pp. 98, 99.

[83] Also, the level of infant mortality in Bedfordshire was higher amongst the elite than the control population in 1700-49. See Razzell, *Population*, p. 133.

Also, the lack of an association between socio-economic status and child mortality in the mid-nineteenth century depicted in Table 8 and found elsewhere, suggests that disease environment rather than poverty was the most important factor in shaping the level of mortality.

The explanations of these trends are complex: the wealthy are known to have fled London and other towns during the plague, to have escaped childhood diseases such as smallpox by moving away from areas known to be affected by the disease, and to have avoided marsh areas known to suffer from endemic malaria.[84] It is possible among other factors that by the mid-nineteenth century the avoidance of disease was no longer important in protecting wealthy groups from infection, particularly when they lived in urban areas.

The falls in infant mortality in rural and provincial parishes from the middle of the eighteenth century may have been in part due to an autonomous reduction in disease incidence,[85] as well as the result of a variety of health improvements. These included better breastfeeding practices, inoculation/ vaccination against smallpox, and improved personal and domestic hygiene,[86] linked to growing literacy amongst women.

The dramatic reduction of infant mortality in London was also probably a result of major improvements in public health – increased water supplies, better drainage, and rebuilding of the urban landscape – as well as much better maternal and neo-natal care.[87]

---

[84] Riley, *The Eighteenth Century*; Dobson, *Contours.*

[85] J. D. Chambers, *Population, Economy and Society in Pre-Industrial England*, 1972.

[86] E.L. Jones and M.E. Falkus, 'Urban improvement and the English economy in the seventeenth and eighteenth centuries' in P. Borsay 'Cleaning up the Great Wen: public health in eighteenth century London', in W.F. Bynum and R. Porter (eds.), *Living and Dying in London: Medical History Supplement*, Number 11, 1991; Razzell *Essays*, pp. 224-29; Razzell, *The Conquest.*

[87] M. D. George, *London Life in the Eighteenth Century*, 1966,, p. 61;

Although most of these measures were not the result of economic developments, clearly economic change did have an indirect influence on mortality. Agricultural improvements led to the drainage of marshland which may have contributed to the elimination of malaria,[88] and the production of cheap cotton cloth enabled working class families to improve their standard of personal hygiene. There was also an economic element in some of the other factors responsible for mortality decline: for example, the rebuilding of houses and house floors in brick and stone. The increasing use of coal enabled water to be boiled more easily, important for personal and domestic hygiene.[89] However, elite social groups had always had the economic resources necessary for these improvements, and the majority of them probably resulted from new attitudes towards disease, personal hygiene and the environment.[90] These changes in attitude and belief appear to have first influenced the educated and wealthy, and gradually spread to the general population later in the eighteenth and nineteenth centuries.

However, the reduction in adult mortality occurred more-or-less equally amongst all areas of the country and in all socio-economic groups, suggesting that there was an 'autonomous' fall in the adult death rate from the early eighteenth century onwards.[91]

I. Loudon, *Death in Childbirth: an International Study of Maternal Care and Maternal Mortality, 1800*-1950, 1992; I. Loudon, *The Tragedy of Childbed Fever*, 2000, p.61.

[88] Dobson, 1997.

[89] I would like to thank Tony Wrigley for pointing out the potential importance of coal in boiling water for improving personal hygiene. For the use of boiling water and milk in preventing infant diseases see I. Marks and M. Worboys, *Migrants, Minorities and Health,* 1997, p. 192.

[90] This shift in attitudes was partly associated with the eighteenth century enlightenment movement. The Royal Society's statistical investigation in the 1720s into the effectiveness of inoculation − comparing natural smallpox mortality with that amongst the inoculated − is perhaps the first historical example of a scientific assessment of a medical treatment. Razzell, *The Conquest*, pp. 172-74.

[91] Chambers, *Population*.

THE HISTORY OF NUPTIALITY ND FERTILTY

The Cambridge Group data in Table 5 suggest that there was no long-term rise in fertility in the eighteenth century, as there were no significant changes in baptism registration reliability or changes in the age structure of the national population. However, the factors shaping fertility are complex and need to be examined in some detail. The Cambridge Group found from their reconstitution research that there was a decline of about two-and-a-half years in the average age of marriage of spinsters during this period.[92] This finding is somewhat contradicted by data from marriage licences – which indicate that average age of marriage rose by about a year in the eighteenth century – but these licences tended to exclude the poorest socio-economic groups.[93]

There is a difficulty with reconstitution calculation of marriage ages. Marriage registers in the early period rarely give information on the marital status of grooms or brides, and there was a major shift in marital status during the eighteenth century. Wrigley and Schofield concluded that "perhaps as many as 30 per cent of all those marrying were widows or widowers in the mid sixteenth century … By the mid nineteenth century, in contrast, it is clear from civil registration returns that a comparable proportion was much lower at 11.27 per cent."[94] Marriage Licence data confirm this conclusion, but it represents a problem for reconstitution research on marriage ages. During the late seventeenth century about 26 per cent of spinsters in East Kent married widowers, and on average they married 3.8 years later than spinsters marrying bachelors.[95] A twenty per cent

[92] Wrigley, Davies, Oeppen, Schofield, *English Population*, p. 149.
[93] Razzell, *Mortality,* p. 71.
[94] Wrigley and Schofield, *The Population*, pp. 258, 259.
[95] Razzell., *Population,* p. 131.

reduction in the number of widower marriages would lead to a fall of 0.76 years – 3.8 x 1/5 – in the overall marriage age of spinsters, and this would be the result of the changing marital status of grooms and brides during this transition period.

Nevertheless, new evidence suggests that the fall in the average marriage age of spinsters found by the Cambridge Group is largely genuine. Although there is a lack of reliable national data, marriage licences indicate that there was a radical shift in the relative ages at which the wealthy and the poor married in the seventeenth and eighteenth centuries. In Nottinghamshire and Gloucestershire during the seventeenth century the average age of spinsters marrying labourers and husbandmen was over 26 years, whereas the average for yeomen, gentlemen and professionals was between 22 and 24 years.[96] These figures include spinsters marrying both bachelors and widowers, but an analysis of the 100 first cases of spinsters marrying bachelors reveals a similar pattern:

Table 13: Marriage Ages of Spinsters Marrying Bachelors in the Diocese of Nottinghamshire, 1672-1685.[97]

Gentlemen & Professionals	*Yeomen*	*Artisans & Tradesmen*	*Labourers*
Mean = 23.0 Years	Mean = 23.5 Years	Mean = 24.1 Years	Mean = 25.2 Years
Proportion under 21 = 29%	Proportion under 21 = 23%	Proportion under 21 = 9%	Proportion under 21 = 5%

The high marriage age of spinsters marrying labourers is confirmed by a reconstitution study of their marriages occurring in Bedfordshire in the period 1650-1749. It was possible to trace 77 marriages in the baptism register, yielding a mean age at

[96] Ibid, pp. 242-43.

[97] Source: T.M. Blagg and F.A. Wadsworth (eds.), *Abstracts of Nottinghamshire Marriage Licences 1577-1700,* 1930.

marriage of 26.7 years with 18 per cent marrying under the age of 21.[98] The mean age is higher than that listed in Table 13 for labourers, and this may be because it included marriages to widowers as well as bachelors.

A transition in this pattern occurred in the eighteenth century and was very marked in the Archdeaconary of Chichester, as revealed by the proportions of spinsters marrying under the age of 21:

Table 14: Proportion of Spinsters Marrying Under 21 in the Archdeaconary of Chichester, Sussex, 1754-1799.[99]

Period	*Labourers*		*Yeoman, Gentlemen & Professionals*	
	Number	Proportion Under 21	Number	Proportion under 21
1754-69	142	9%	142	22%
1770-99	163	25%	163	14%

By the nineteenth century there were significant differences in marriage ages between these socio-economic groups. Marriage ages were sometimes included in civil registration returns, and an analysis of Surrey and Bedfordshire parishes where such information was recorded, yielded the following differences.

[98] The analysis was carried out on data in the Bedfordshire Family History Database covering 124 parishes in the county, selecting all marriages where the groom was listed as a labourer and the bride as a spinster.

[99] Source: Razzell, *Population,* p. 244.

Table 15: Marriages of Brides Marrying Bachelors in Surrey and Bedfordshire, 1837-71.[100]

Grooms Occupation	*Proportion of Brides Signing the Marriage Register*	*Mean Age of Marriage (Years)*	*Proportion Marrying under Twenty-One*
Surrey			
Labourers	68.0%	23.0	31.4%
Artisans & Tradesmen	90.0%	24.4	17.2%
Farmers	96.0%	26.1	12.9%
Elite Occupations	99.4%	25.3	17.8%
Bedfordshire			
Labourers	34.2%	22.2	37.6%
Artisans & Tradesmen	67.0%	23.0	26.4%
Farmers	83.3%	25.1	10.5%
Elite Occupations	100%	27.8	15.8%

There was approximately a three year difference in the mean age of marriage between labourers and farmers/ elite occupations, with artisans and tradesmen occupying an intermediate position.

[100] Source: Marriage civil registers in the Surrey and Bedfordshire Record Offices. The marriages were selected from parishes in alphabetical sequence up to the parish of Ham in Surrey and Potsgrove in Bedfordshire for the period 1837-71. The numbers of marriages in the calculation of marriage ages were as follows: Surrey: labourers: 1,759; artisans & tradesmen: 2,039; farmers: 102; elite occupations (gentlemen, professionals & merchants): 102. Bedfordshire: labourers: 1,955; artisans & tradesmen: 1,268; farmers: 102; elite occupations: 38.

There were similar differences in marriage ages of spinsters in England & Wales in 1884-85. The mean age of brides marrying bachelor labourers was 23.7 years, farmers 28.9 years, and professionals 26.4 years.[101] This is the reverse to what was found in the seventeenth century, as a result of labourers' marriage ages falling significantly and those of elite occupations rising during the eighteenth and early nineteenth centuries.

This was the socio-economic pattern of marriage described by Malthus, with the poor marrying at a much earlier age than the wealthy. He was born in the parish of Wotton, Surrey, where in later life he became curate, and his family home was in the neighbouring village of Albury.[102] He was very familiar with the marriages of the poor of these parishes, as well as the marriage habits of his wealthier contemporaries. It is probable that reduced adult mortality led to the rich to marrying much later, contrasted with the poor marrying much earlier as a result of pauperisation.[103] The artisan and tradesmen class appear

[101] Woods *The Demography*, p. 86.

[102] P. James, *Population Malthus: His Life and Times*, 1979, pp. 13, 34, 40.

[103] As we saw earlier, Malthus stressed the link in England between poverty and early marriage. There is no consensus on patterns of real income and economic inequality in the eighteenth and early nineteenth century. For example, see G. Clark, 'The long march of history: farm wages, population, and economic growth, England 1209-1869' *Economic History Review*, Volume 6, 2007; G. Clark, 'The Consumer Revolution: Turning Point in Human History, or Statistical Artifact', *Department of Economics, University of California, Davis, Working Paper*, 2010; S. Broadberry, B.M.S. Campbell, A. Klein, M. Overton, B. Van Leewen, *British Economic Growth, 1270-1870*, 2015. However, the increasing pauperisation of labourers at the end of the eighteenth and beginning of the nineteenth century was described by nearly all contemporaries, including Horatio Nelson. See N.H. Nicolas, *The Dispatches and Letters of Vice Admiral Lord Viscount Nelson, Volume 1, 1777-94*, 1845, p. 295. See also J. Howlett, *Examination of Mr Pitt's Speech in the House of Commons ... February 12th, Relative to the Condition of the Poor*, 1796; D. Davies, *The Case of Labourers in Husbandry*, 1796; W. Cobbett, *Rural Rides*, 2001; J. and B. Hammond, *The Village Labourer,* 1911; J. and B. Hammond, *The Town Labourer,* 1917; J. and B. Hammond, *The Skilled Labourer,* 1919; G. Taylor, *The Problem of Poverty,* 1969; B. Inglis, *Poverty and the Industrial*

to have occupied an intermediate position, with little change in their marriage ages. However, the frequency of marriage was also a major determinant of fertility, and as Wrigley and colleagues have concluded "until the middle of the eighteenth century the substantial swings in nuptiality were produced almost exclusively by wide variations in the proportion of women never marrying."[104]

There is now evidence that marriage was nearly universal in the seventeenth century. Shepard and Spicksley have compiled data from church court depositions covering nearly all areas of England, showing that only about 3 per cent of women aged above 45 were single.[105] Information from a range of other sources – censuses, church court deposition, burial registers, wills and family genealogies – confirm this conclusion.[106] This changed during the eighteenth century as illustrated by data for the London Consistory Court.

Table 16: Proportion of Female Deponents Single in the London Consistory Court, 1583-1817.[107]

Period	*Age Group – Proportion Single*			
	15-24	25-34	35-44	45+
1586-1611	62%	15%	1%	0%
1703-1713	72%	25%	7%	4%
1752-1783	77%	43%	14%	5%
1792-1817	76%	53%	13%	15%

Revolution, 1972*;* E.P. Thompson, *The Making of the English Working* 1980; D. Vincent, *Bread, Knowledge and Freedom: a Study of Nineteenth Century Working Class Autobiography,* 1981*;* J. Humphries, 'The lure of aggregates and the pitfalls of the patriarchal perspective: a critique of the high wage interpretation of the British industrial revolution', *Economic History Review*, Volume 66, 2013.

[104] Wrigley and Schofield, *The Population*, p. xix.

[105] Razzell, *Mortality*, p. 65.

[106] Ibid, pp. 60-70.

[107] Source: Ibid, p. 67.

There were significant reductions in the frequency of marriage in all age groups during the eighteenth century, and this was also the case in Yorkshire and other areas of England. [108] The explanations for this trend are complex but it appears that it occurred particularly amongst the wealthy and the well-educated.[109] There were major changes in literacy levels amongst wealthy women in the eighteenth century, as illustrated by the proportion of women signing wills in London.

Table 17: Proportion of Women Signing London Wills, 1599-1851.[110]

Period	*Proportion Signing Wills*	*Number of Cases*
1599-1601	2%	100
1639-1641	15%	100
1699-1701	38%	100
1749-1751	64%	100
1799-1801	77%	100
1849-1851	86%	100

However, literacy was not a sufficient condition to sustain a single marital status, as in the late eighteenth century many of the poor were literate but with very high levels of marriage frequency.[111] It was important to have the economic resources to be able to sustain a single marital status, although these are complex issues requiring further clarification.

[108] Ibid, pp. 60-70. Recently Szreter and Garrett have argued that there was a decline in the frequency of marriage from the middle of the eighteenth century onwards. S. Szreter, E. Garrett, 'Reproduction, compositional demography, and economic growth: family planning in England before the fertility decline', *Population and Development Review,* 2000, p. 67.

[109] Razzell, *Mortality,* pp. 74-77.

[110] Source: Ibid, p. 86. The figures are based on the first 100 women leaving wills selected alphabetically in the periods in question.

[111] Ibid, pp. 75-77.

The socio-economic patterns of marriage age and the frequency of marriage had a direct impact on fertility levels. The general relationship between status and fertility was widely recognised by contemporaries in the nineteenth century, summarised by Wrong as follows:

> In England most of the writers who took part in the Malthusian controversy in the early part of the nineteenth century were full aware of the existence of a negative relationship between fertility and socio-economic status. It was referred to by Malthus himself, by William Godwin, John Stuart Mill, Harriet Martineau, and Nassau Senior, to mention only a few of the better know intellectual figures of the day.[112]

Glass was the first to analyse the relationship between socio-economic status and fertility which occurred in the middle of the nineteenth century. He found a strong correlation between the social status of a London registration district and its gross reproduction rate in the period 1849-51, even allowing for the presence of servants.[113] There were similar associations in other wealthy and poor districts, with the wealthy areas having higher literacy and lower fertility rates.[114] Data for Bedfordshire indicates that fertility was particularly high amongst labourers compared to other occupational groups:

Table 18: Bedfordshire Baptism Fertility Rates, 1849-51.[115]

Occupational Group	*Number of Baptisms 1849-51*	*Number of Men Living Aged 20-50 in 1851*	*Annual Fertility Rate per 100 living*

[112] J. Wrong, 'Class fertility differentials before 1850', *Social Research*, Volume 25, 1958, p. 67.
[113] D.V. Glass, 'Fertility and economic status in London', *Eugenics Review*, Volume 30, 1938, p. 118.
[114] Razzell, *Mortality*, pp. 81-83.
[115] Source: Ibid, p. 84.

Labourers	5,280	10,887	16.2
Artisans, Tradesmen	3,008	11,120	9.0
Farmers	294	1,148	8.5

The findings on status and fertility are consistent with the evidence on the relationship between status and marriage previously discussed. The overall impact of marriage patterns and fertility levels is more difficult to assess. The falling mean age of marriage amongst labourers – and they formed a large part of the total population – has to be contrasted with the declining frequency of marriage amongst other groups. The best evidence on changing fertility levels in the eighteenth century is provided by Table 4, which indicates that there was no significant change during this period, suggesting that the decline in mean marriage age was balanced by an overall reduction in the frequency of marriage.

CONCLUSION

Contrary to his well-known theory, Malthus presented evidence to show that population growth in eighteenth century England was largely caused by falling mortality rather than rising fertility, and that the frequency of marriage diminished as a result of this reduced mortality. This was an early form of the demographic transition theory, and data is produced in this paper to confirm this conclusion. Adult mortality approximately halved from the beginning to the end of the century, with reductions occurring amongst all socio-economic groups and in all areas of the country. Infant and child mortality fell at a later date from the middle of the eighteenth century onwards, reducing first amongst the wealthy.

New evidence suggests that nearly all women were married in the seventeenth century, contradicting Hajnal's theoretical notion of a European marriage pattern. As predicted by Malthus, the reduction in mortality led to a fall in the

incidence of marriage. The proportion of married women diminished during the eighteenth century in all age groups, particularly amongst the wealthy and literate, linked to a major increase in female literacy. This was counter-balanced by a decrease in the mean age at marriage amongst the poor, compared to an increasing age of marriage amongst the wealthy. The net effect of these developments was the stabilisation of fertility.

It is argued that the reduction in mortality was largely independent of economic growth. This conclusion is supporter by Wrigley and Schofield's conclusion that ' the dominant influence on mortality trends appear to have been exogenous to the economic system, or at least not to have been regularly and substantially affected by changes in living standards.'[116] The fall in mortality probably resulted from an autonomous reduction in disease virulence, along with a number of medical innovations and an improvement in personal and public hygiene.

A detailed review of the evidence on England's population growth in the eighteenth century indicates that it was Malthus's more empirical analysis rather than his theoretical arguments that were valid for this period. It was a time in which a demographic transition was taking place, with mortality falling largely as a result of changes in the disease environment. The autonomous reduction in disease severity as suggested by Malthus, is indicated in the decline in mortality among both European and other countries without economic development.[117]

Adult mortality approximately halved amongst all socio-economic groups and in all areas of the country from the early eighteenth century onwards, confirming Malthus's analysis. However, infant and child mortality reduced from the middle of the eighteenth century which is not consistent with Malthus's prediction of a decline of infectious diseases at the beginning of the century. These forms of mortality first reduced amongst the

[116] Wrigley and Schofield, *The Population*, p. 354.
[117] Jack Goldstone, 'Capitalist origins of the English revolution' *Theory and Society,* 1983, p. 173.

wealthy, suggesting that economic factors were not primary in shaping these mortality patterns.

Also as predicted by Malthus, there was a significant reduction in the incidence of marriage. There were also changes in the age of marriage, with the wealthy and middle classes marrying at a significantly later date, and the poor marrying at an increasingly earlier age. It appears that labourers and the poor suffered increasing pauperisation resulting from growing life expectancy and population numbers, leading to demoralization and early marriage. The later marriage of the wealthy and middle classes was probably largely the result of reduced mortality, although there is evidence that the growing education and literacy of women may have also played a role. This is similar to findings about the influence of women's education on fertility levels in developing countries in the twentieth century.

New research indicates that nearly all women were married in the seventeenth century, contradicting Hajnal's notion of a European marriage pattern. This changed in the eighteenth century particularly amongst the elite, and combined with shifts in class based marriage ages, this resulted in a significant socio-economic gradient in fertility levels in the first half of the nineteenth century. As with marriage ages the incidence of marriage was probably linked to the growing literacy of women.

This is consistent with demographic transition theory, different from Malthus's theoretical arguments about the relationship between economic development and population growth for which he is famous. The transformation of mortality levels without significant economic development is similar to the twentieth century experience of poor countries such as Sri Lanka, Cuba, Kerala, Costa Rica and Albania.[118] Although the

[118] S.B. Halstead, J.A. Walsh, K. S. Warren, *Good Health at Low Cost*, 1985; J. Caldwell, 'Routes to low mortality in poor countries', *Population and Development Review*, Volume 12, 1986; A. Gjonca, *The Paradox of Mortality Transition in Albania, 1950-90*, 1991; R.A. Easterlin, 'How beneficent is the market? A look at the modern history of mortality', *European Review of Economic History*, Volume 3, 1999; D.M. Cutler, A.S.

Cambridge Group has argued that Malthus's theoretical arguments are largely valid for England in the eighteenth century, the evidence reviewed in this paper indicates that it was diminishing mortality rather than increasing fertility that was the prime reason for population growth in this period.

Demography has been seen traditionally by economists and other social scientists as a function of economics, but the evidence presented in this paper shows that population has acted in England during the eighteenth century largely through changes in disease patterns as an independent force in helping to shape England's economic and social development.

Deaton, A. Llera-Muney, 'The determinants of mortality', *Journal of Economic Perspectives*, Volume 20, 2006; R.A. Easterlin, 'Cross sections are history' *Population and Development Review*, Volume 38, 2012.

The Geography of Smallpox in England before Vaccination: a Conundrum Compounded.

Abstract

Davenport, Satchall and Shaw-Taylor have presented evidence confirming the pattern of age profiles of smallpox victims in the north and south of England, as well as Scotland and Sweden. They have argued that the presence of adult smallpox burials in the south of England was the result of avoidance of the disease linked to the presence of pest houses from the late seventeenth century onwards. Evidence is presented in this paper to show that the age pattern of smallpox in the south was present as early as the sixteenth century, indicating that the age profile of the disease was associated with avoidance practices at a much earlier date. Smallpox virulence grew steadily from the sixteenth to the nineteenth century, explaining why pest houses were not used for the isolation of the disease until the end of the seventeenth century. The greater wealth and resources of the elite – royalty, the aristocracy, gentry, lawyers, and merchants – enabled these groups to flee smallpox. The royal family occupied palaces in all areas of southern England, and in annual 'progresses' took their servants and dependants into surrounding metropolitan counties. It is hypothesized that by taking their servants and dependants with them, and by attracting the support of a wide network of tradesmen, these elite groups helped create a culture of disease avoidance in a wider population. Additionally, it is argued that the greater literacy and Protestantism of London and the south was associated in metropolitan areas with an opposition to fatalistic religious resignation to disease. In Sweden it was its position as a continental power subject to frequent wars and trading activities which resulted in the importation of smallpox and the occurrence of childhood disease. However, further research is necessary before the conundrum of the age profile of smallpox before vaccination is fully resolved.

Introduction

Romola Davenport, Max Satchell and Leigh Shaw-Taylor should be commended for their research regarding the geography of smallpox in pre-vaccination England. (Davenport, Satchell and Shaw-Taylor, 2018. By compiling seven million records donated by family history and genealogical societies in electronic form, they have identified 225 burial registers from the period 1540-1799 that reported smallpox burials with some indication of age status. This compiling of digital records is likely to be the future of research for medical and demographic history, allowing detailed exploration of a number of important issues.

They have confirmed my own analysis of the distribution of smallpox burials by age in England, with child burials concentrated in the north and a mixture of adult and child burials mainly in the south. (Razzell, 2003, pp. xi-xiii; Davenport, et.al., 2018: p. 80). They have also confirmed the concentration of general inoculations in the south of England (Razzell, 2003: pp. xix, xx; Davenport et. al, 2018: p. 79).

They have concluded that "practices designed deliberately to stop the spread of smallpox (isolation of the poor in pest houses and general immunisation) explained almost all of the strong spatial patterning observed in the sample." (Davenport et. al, 2018: p. 83). There are however a number of problems with their analysis, which may be summarized as follows.

1. They concluded that "the relatively small differences in case-fatality rates by age mean that the age structure of smallpox burials provide some indication of the age profile of those infected." (Davenport et.al, 2018: p. 76) However, there is evidence that there were marked differences in the fatality of smallpox burials by age.

2. There is also evidence that the pattern of age distribution of smallpox was present in England as early as the sixteenth century, well before the use of pest houses for isolation of the disease.

3. Their analysis takes no account of the rising virulence of smallpox between the sixteenth and nineteenth centuries.

4. In the case of Sweden, there is a more plausible explanation for the concentration of smallpox amongst young children than provided by the authors.

I will discuss these issues under the above headings.

Age Related Smallpox Case-Fatality Rates.

The earliest evidence on the age related fatality of smallpox is for the rural parish of Aynho in Northamptonshire.

Table 1: A Smallpox Epidemic in Aynho, Northamptonshire, 1723-24 (Razzell, 2003: p. 153)

Ages	Cases	Burials	Percentage Fatality
Under Ten	28	4	14%
10-20	47	4	9%
20-30	25	6	24%
30+	32	11	34%

Although the number of cases is small, it suggests that there was a significant difference in the fatality of smallpox by age in this rural parish. This is confirmed by data published by the Whitehaven Dispensary at the end of the eighteenth century.

Table 2: Age Specific Case Fatality Rates of Smallpox in the Whitehaven, Cumbria Dispensary, 1783-1804 (Razzell, 2003: p. xviii)

Age Group (Years)	Number of Smallpox Cases	Number of Smallpox Deaths	Case Fatality Rate
0-2	378	139	37%
2-5	665	105	16%
5-10	308	32	10%
10+	36	3	8%

There were marked differences in smallpox mortality by age in this northern town parish, with the disease nearly four times more fatal among children under the age of two compared to children aged five to ten years. There is also evidence that there was a U-shaped pattern of case fatality between the young and old. For example, an analysis of 15,000 unvaccinated cases in London towards the end of the nineteenth century revealed the following:

Table 3: Case-Fatality Rates in the Metropolitan Boards Hospitals, 1867-72. (Smith, 1987: p. 63; Creighton, 1965, 2: p. 618)

Age	Fatalities Expressed as Percentages of Cases
Under 5	52
5-10	26
10-20	9
20-30	17
30-40	24
40-50	29
50-60	28
Over 60	20

This U-shaped pattern is confirmed by data from other countries (Razzell, 2003: p. 167), and the above evidence contradicts Davenport et.al's statement that smallpox burials reflect the incidence of the disease itself. We must therefore proceed with caution when analysing data from burial registers, which can only very broadly suggest age-patterns of the incidence of smallpox.

Age Related Patterns of Smallpox Incidence in the Pre-Eighteenth Century Period.

Davenport et.al have concluded that the pattern of mixed childhood/adult smallpox burials in the south of England is the result of avoidance of the disease. They argued that "the most readily quantifiable evidence of smallpox avoidance is the use of pest houses to isolate (mainly poor) smallpox victims ... and that the preventative practices identified here do not appear to be of ancient origin, but developed over the course of the late seventeenth and eighteenth centuries." (Davenport et.al., 2018: pp. 77, 84) In support of this conclusion they present evidence to suggest that smallpox isolation houses only existed from the late seventeenth century onwards. (Davenport et.al., 2018: p. 79) Yet there is data to suggest that the age-related pattern of smallpox existed as early as the sixteenth century.

Table 4: Age of Smallpox Burial in St. Boltoph Aldgate, 1583-99 (Forbes, 1971:p. 103)

Age Group	Number of Smallpox Burials	Proportion of Total
2-6 Months	8	6.8%
7-11 Months	9	7.7%
1 Year	24	20.5%
2 Years	14	12.0%
3 Years	14	12.0%
4 Years	6	5.1%
5-6 Years	8	6.8%
7-9 Years	7	6.0%
10-14 Years	0	0%
15-19 Years	7	6.0%
20-29 Years	8	6.8%
30-39Years	7	6.0%
40-49 Years	2	1.7%
50-59 Years	2	1.7%
60-69 Years	1	0.9%
Total	117	100%

Smallpox was present in Aldgate every year in the period between 1583 and 1599 (Forbes, 1971: p. 104), and was endemic in London at this time, with the majority of burials being of children under the age of ten[1]. However, there were also a significant number of adult smallpox burials at this time, similar to what was found in London in the middle of the eighteenth century.

Table 5: Age of Burial of Smallpox Victims in London (Forbes 1971, p. 100; Razzell, 2011: p. 1316; Razzell, 2016: p. 5; Davenport, Schwarz and Boulton, 2011: p. 1295)

	0	1-4	5-9	10-19	20+	Total Number
St. Botolph Aldgate, 1583-99	14.5%	49.6%	12.8%	6.0%	17.1%	117
St. Mary Whitechapel, 1743-48	21.1%	54.7%	10.3%	2.3%	11.7%	351
St. Martins in the Fields, 1752-66	13.7%	54.5%	10.9%	4.6%	16.3%	1083
St. John, Wapping, 1763-67	19.9%	52.4%	9.0%	3.0%	15.7%	351

Additionally, a third of the fifteen smallpox burials in the parish of Bermondsey were over the age of ten in the period 1611-41.[2] This parish was on the south bank of the Thames and next to London Bridge, supporting the conclusion that a significant proportion of smallpox victims in London in the late sixteenth and early seventeenth century were adults.

I have previously presented evidence to show that the presence of adult smallpox victims was due to the migration into London of adults who had escaped the disease in its rural hinterlands, and that these adult victims largely disappeared in London as a result of general inoculations in these rural areas.[3] (Razzell, 2011; Razzell, 2016). Davenport, Satchell and Leigh-Taylor have accepted that the presence of adult smallpox victims in London was largely due to migration patterns:

> in large towns where smallpox was constantly present, adults accounted for a significant proportion of smallpox victims in the south. This was because urban populations in this period were heavily dependent on rural immigration, and therefore urban populations included many adult migrants from rural areas who had not encountered smallpox in childhood. McNeill [described] ... a transitional phase, where immunising diseases such as smallpox had become endemic childhood diseases amongst long-term urban residents, but remained relatively infrequent and epidemic in surrounding rural areas. In this situation adult migrants to towns were often immunologically naive, and fell victim to urban diseases upon arrival, producing bimodal patterns of smallpox infection by age ... Young adults constituted the main source of migrants to London, and the bimodal pattern of smallpox victims confirms McNeill's prediction regarding the vulnerability of rural-urban migrants.' (Davenport, Satchell and Leigh-Taylor, 2018: p. 76; Davenport, 2018: p. 3)

[1] There was a similar pattern of childhood smallpox in the parish of Allhallows in the Wall in the same period. (Allhallows in the Wall burial Register, 1878, Chiswick Press).

[2] I would like to thank Romola Davenport for sending me this information.

[3] Data compiled by Rosemary Leadbeater for Oxfordshire indicates that adult smallpox burials as a proportion of the total fell from 16.6% in 1714-38 to 15.8% in 1740-68 and 6.0% in 1770-99, probably as a result of general inoculations. (Leadbeater, 2015: pp. 49-54)

The presence of adult smallpox victims in Aldgate in the later sixteenth century suggests that a similar pattern of migration was in existence at that time, with rural southern populations experiencing the disease during adulthood. This is confirmed by evidence from a number of sources. In Shipton-under-Wychwood, Oxfordshire there were three smallpox burials in the late sixteenth and early seventeenth century: adults in both 1587 and 1616, and a 'youth' in 1624.[4] In the parish of Hadleigh in Suffolk six of the twenty-six smallpox burials in 1633 were adults – 23 per cent. In 1645 a smallpox epidemic broke out amongst adult soldiers in the garrison at Newport Pagnell in Bedfordshire. (Godber, 1969: pp. 281, 282) In Bridford, Wiltshire in 1655/56 there were four adult smallpox burials – a shepherd, a wife, a servant and an adult woman.[5] In Brenchley, Kent in 1657 all four smallpox burials were of adults.[6]

There is abundant evidence for the presence of smallpox amongst the elite population in the sixteenth and early seventeenth century. Creighton summarized the incidence of smallpox during the late sixteenth and early seventeenth century as follows:

> In 1593 we come across the first systematic English essay on the disease [of smallpox] ... by Simon Kellwaye ... 'the smalle poxe doth generally abound both in young and old people.' In 1613, the Lord Harrington ... died of the smallpox ... at which date also the Lady Burghley and two of her daughters were sick of the same disease ... All the indications, whether from letters of the time, from poems and plays, or from statistics, point to the first Stuart reigns as the period when smallpox became an alarming disease in London among adults and in the upper class .... we do know from references to smallpox in the familiar writings of the Stuart period that many of its attacks, with a high ratio of fatalities, must have happened to adults. Thus, to take the diary of John Evelyn, he himself had smallpox abroad when he was a young man, his two daughters died of it in early womanhood within a few months of each other, and the suitor for a hand of one of them died of it about the same time. Medical writings leave the same impression of smallpox attacking many after the age of childhood.' (Creighton, 1, 1965: p. 461; Creighton, 2, 1965: pp. 435, 436, 443, 444)

Most of the elite population referred to by Creighton lived in the south of England, like the children of the Reverend Ralph Josselin born in rural Essex. He had five children who had escaped smallpox until the onset of their adolescence, but all caught the disease when they moved to live in London: Tom aged fifteen in 1659; Ann aged fourteen in 1668, John aged eighteen in 1669, Elizabeth aged eighteen in 1678, and Rebecka aged seventeen in 1680. (Macfarlane, 1970: pp. 112, 118-20, 170, 234)

Deaths from smallpox were recorded frequently in the diaries and writings of the wealthy. For example, "smallpox claimed the only son of the sixth Earl of Huntingdon on 24 June 1649 ... an undistinguished nineteen-year old ..." (Anselment, 1989: pp. 72, 73) In September 1660, Henry Duke of Gloucester, fell ill aged 21 with smallpox and died on the tenth day of his illness. (Hopkins, 1983: p. 37) Princess Mary of Orange too died of smallpox at Whitehall aged 29 in the same year. (Hopkins, 1983: pp. 37, 40)

Joan Moody has collected all references to adult smallpox in Oxford in the antiquarian Anthony Wood's recollections:

> "... in 1662 'smallpox rages at New College' ... and in May [1666] 'John Fisher, A,B, of Lync. Coll. died of the small-pox being the fifth of that College that hath died of that disease this present year, eleven having been sick of it at that Coll' ... On 23rd November [1668] 'Mr Thomas Hobs B.D. fellow of Magd. Coll. Died of the small-box

[4] I would like to thank Rosemary Leadbeater for this reference.
[5] I would like to thank Barbara and colleagues at the Wiltshire Family History Society for this reference.
[6] Data was kindly provided by Romola Davenport.

> buried in the chapel. Fourteen of that house sick of the small-pox by the 6th of Dec." (Moody, 1996: pp. 39, 40)

There is no evidence of a pest house in Oxford devoted to isolating smallpox during the late seventeenth century, but the town had significant numbers of adult smallpox victims in this period.

There is limited evidence from parish registers confirming the age pattern of smallpox burials in the north of England in the seventeenth century, which is mainly for the general population. Creighton again summarized some of this: "The reference to smallpox at Aberdeen in 1610 is to a disease among children; and so also is a unique entry, opposite the year 1636, on the margin of Trinity parish, Chester': 'For this two or three years, divers children died of smallpox in Chester.'" (Creighton, 2, 1965: p. 436) The burial register of Ellastone in Staffordshire registered ten smallpox burials in 1636, and where it was possible to trace the age status of these burials, seven were young children and one was an adult servant.[7] According to the Bolton, Lancashire burial register in 1647/48, all 63 smallpox burials in the town were children; and likewise all 65 smallpox burials in 1655/56 again were children. (Bolton Burial Register) Duncan et.al carried out a reconstitution study of Penrith in Cumbria and found that the mean age of those dying from smallpox in the years 1656 and 1661 was 4.5 years. (Duncan, Scott and Duncan, 1983: p. 409) The Reverend Oliver Heywood noted in his diary for the year 1667 that of a friend's children living in Yorkshire, ten had caught but recovered from smallpox in that year. (Turner 1882: p. 237)

There is however a relative paucity of evidence from burial registers in the late sixteenth and early seventeenth centuries both in the south and north of England. This is probably because the disease was so mild in this period that clergymen and their clerks did not feel it worthwhile to notify its prevalence. As a result, further research is required to fully establish the age pattern of smallpox in the late sixteenth and early seventeenth century.

Case Fatality of Smallpox in the Period between the Sixteenth and Nineteenth Centuries.

Many contemporaries noted the increasing virulence of smallpox between the early seventeenth and late nineteenth centuries (Carmichael, A.G. and Silverstein, A.M., 1987), and there is biological evidence for a surge of virulence in the sixteenth century. (Duggan et al., 2016) In 1641, Sherwood claimed that smallpox had become "more malignant than any that have reigned in my remembrance." (Sherwood, 1641: p. 9) Miller summarized the history of the increasing virulence of the disease as follows:

> It was not until the seventeenth century... [that smallpox] begin to figure as a major hazard arousing dread and anxiety ... It was originally associated with the measles by Arabic writers, a union which continued as late as the seventeenth century ... (Miller, 1957: p. 29)

This conclusion is supported by contemporary writings:

> Dr Tobias Whitaker [one of the king's physicians] who had attended the Court in it exile ... On his return to London in 1660, he seemed to find as great a change in smallpox as in the disposition of the people towards the monarchy. His statement as to the change for the worse that had come over smallpox within his memory.... 'This disease of smallpox', he proceeds, 'was antiently and generally in the common place of *petit* and *puerile,* and the cure of no moment ... ... for hundreds of years ... hath been as commonly cured as it hapned ...' (Creighton, 1965, 2: pp. 439, 440)

[7] I would like to thank Owen Gower of the Jenner Museum for providing the data on which this conclusion is based.

"An anonymous publication of 1663 was called *Hactenus inaudita,* the increasing mortality of smallpox being the hitherto unheard-of thing." (Miller, 1957: 30) Marchmont Needham in 1665 ... "pointed out that the smallpox and measles had been very gentle until about forty years earlier ..." (Miller, 1957: p. 30)

Lettsom, writing later in 1805 stated that "I think, from my own experience, that the malignity [of smallpox] even in London is augmenting. When I practised here, 35 years ago, one in ten was the calculation; but I think one in six is now a fair proportion." (Razzell, 2003: p. 179) And in the late nineteenth century McVail concluded through a detailed examination of the sources that:

> . . . natural smallpox gradually became throughout the eighteenth century, and up to the epidemic of 1870-73, a more virulent and fatal disease, its maximum fatality being on a large basis of facts 45 per cent ...' (Razzell, 2003: p. 169)

The literary evidence on the increasing fatality of smallpox is supported by the statistical evidence from the Bills of Mortality and other evidence.

Table 6: Smallpox Burials in London, 1574-1759.[8] (Creighton, 1965, 2: pp. 436, 456, 461, 531; Razzell 2003, p. 169)

Period	Proportion of Smallpox to Total Burials
1574-98	1.6%
1629-36	2.8%
1661-79	5.3%
1680-99	6.3%
1700-19	7.0%
1720-39	7.9%
1740-59	8.5%

This table shows a steady and overall a linear increase in virulence of smallpox between 1574 and 1759. Smallpox was more fatal than suggested by this table. Smallpox burials as a proportion of baptisms in London in 1740-59 was 13.5% (Razzell, 2003: p. 198), and as the disease was endemic in the city, this is a more reliable way to assess overall fatality.

As inoculation began to be practised in London after the middle of the eighteenth century, it is no longer appropriate to express smallpox burials as a proportion of total burials as a measure of case-fatality. A more accurate measure is to be found in the statistics of the London Smallpox Hospital:

Table 7: Case-Fatality Rate of Smallpox in the London Smallpox Hospital. (Razzell, 2003: p. 176)

Period	Number of Cases	Case Fatality Rate
1746-63	6456	26%
1776-1800	7017	32%
1836-51	2654	38%

There was a steady increase in fatality in the period 1746-1851, which continued until the end of the nineteenth century. Data for six towns for the period 1887-93 showed that 42.7 per cent

[8] The figures for 1629-1759 are taken from the Bills of Mortality; the figure for 1574-98 is from the parish of Aldgate.

of all unvaccinated children died from the disease. (Razzell, 2003: p. 177) The increasing virulence of smallpox is important because the earlier milder forms led to a greater acceptance of the disease. Monro described apparently longstanding practices in Scotland akin to 'chickenpox parties' where susceptible children were exposed to another child considered to have a favourable case of the disease. (Monro, 1765: p. 3). This practice has also been described in Wales, and amongst families in southern England in the seventeenth century. (Creighton, 2, 1965: pp. 471-2). A similar experience occurred in Diss, Norfolk in 1784: "In March last, the smallpox broke out in this town; it was of so favourable a kind, that the sick did not confine themselves to their houses; by means of which the disease was communicated to several families ..." (Razzell, 2003: p. 118)

The Avoidance of Smallpox in the Pre-Vaccination Period

The use of pest houses to isolate smallpox cases since the late seventeenth century was probably the result of the increasing virulence of the disease. Avoidance of smallpox had certainly existed at an earlier period, particularly amongst the wealthy, who had the resources to enable this. This was part of a general pattern of avoidance of infectious diseases which occurred at least as early as the sixteenth century.

> Henry VIII 'was so terrified of a sickness that plagued 16th century England that he travelled around the country to avoid it ... During certain periods the king would sleep in a different house every night to avoid outbreaks of plague and an illness known as the sweating sickness.' (*The Times*, Friday April 26th 2019: p. 11)

He "was particularly paranoiac about bubonic plague. When his court went on progress, messengers were sent ahead to check whether towns en route were infected. At Windsor and Calais, the sick were dragged out of their houses and left to die in the fields." (Hutchinson, 2014)

Henry caught smallpox aged 22 in 1514 (Creighton, Vol. 1, 1965: p. 456) but his fear of the disease was so great that in 1518 he "and his court were forced to leave Wallingford in Berkshire because of smallpox in that area." (Hopkins, 1983: p. 31; Creighton, Vol. 1, 1965: p. 456) Queen Elizabeth was prevented from staying at Burghley House in 1565 because of the presence of smallpox, even though she had previously been attacked by the disease aged 29, along with her Maid-in-Waiting Lady Mary Sidney, in October 1562. (Jenner Museum Archive, Reference Bekm/19; Behbehani, 1925**:** p. 5).

Creighton summarized how fear of the disease led to such avoidance in the early seventeenth century:

> Several letters relating to a fatal case of smallpox in June [1628] in the house of Sir John Coke in the city (Garlick Hill) bear witness to the dread of contagion through all that circle of society. One of the letters may be cited: "It pleased God to visit Mrs Elleys (Coke's stepdaughter) with such a disease that neither she nor any other of her nearest and dearest friends durst come near her unless they would hazard their own health. The children and almost all our family were sent to Tottenham before she fell sick with us of the smallpox ... twelve days or thereabouts.' ... [She] died the next morning at five o'clock, being buried the same night at ten, with only Sir Robert Lee and his lady of her kindred at the funeral." The letter proceeds: "God knows we have been sequestered from many of our friends' company, who came not near us or fear of infection, and indeed were very circumspect, careful, and unwilling that any should come to us to impair their health."(Creighton, 1965, 2: pp. 435, 436)

In 1634 Katherine Oxiden living in Kent revealed her fears about contact with a family she was staying with. She wrote to a friend:

> I desire that you will doe mee the favefor to let me have a Chamber more for a time too lay a sick boddi in if i should have visited with the smale pox for it is so rife that I looke evri day, when one of us shale have it ... for tis at Browses and wee fetch water and bake together an when we whash we have noe remedie but too come together if they will intrud them selfes in to the kitchen ... (Gardiner, 1933: p. 94)

Another member of the family wrote to a friend in 1641 that as a result of his son's smallpox "that if you thinke I may danger any at your meeting, upon notice given I shall refraine coming." (Gardiner, 1933: p. 216) In the previous year, the Venetian Ambassador's representative reported that as a result of the ambassador's son dying of smallpox it was necessary for "all this household abstaining from communicating with the Court and with all others, as this disease is considered on a par with the plague, since it attacks every age ..." (Calendar of State Papers Venetian, 25, 1642: p. 99)

A similar fear of infection is reflected in the writings of Jane Austen over one hundred-and-fifty years later. She wrote in *Sense and Sensibility:* "the word infection ... gave instant alarm to Mrs Palmer on her baby's account ... and confirming Charlotte's fears and caution, urged the necessity of her immediate removal of her infant." (Austen, 1994: p. 186)

Parishes attempted to isolate smallpox cases from the beginning of the eighteenth century onwards, but this was not always successful. A detailed example of this is what occurred in the town of Lewes in Sussex in 1794.

> On Monday 4th of January, it was represented to the Chief Officers of the Borough that the Small Pox was at that time at its full height in the House of George Apted, in St. Mary's Lane . . . he was determined they [his family] should all remain where they were. The Constables then resorted to the early Measures they saw within their Power; they caused a high wood Fence to be erected around his Door, and placed a Watch both by Night and Day, to prevent the infected Family from mixing any more with other Persons in the Neighbourhood. On Friday the 10th at Six in the Evening, another Meeting on the same Business was called by the Constables. At this second Meeting (which entirely filled the Town Hall) it appeared that the Disorder further manifested itself in the families of several other Persons within the said St. Mary's Lane, and that each of them refused to remove, the Determination of this Meeting was to block up the infected Lane at both Ends . . . Several of the Heads of infected Families having, in the Hall (at a meeting on Saturday, 11th), refused to remove their Children etc or to suffer them to be removed, a General Inoculation was by some thought advisable; it was therefore deemed proper to request the Constables again to adjourn the Meeting to the next Evening (Sunday) and to give the most public Notice by Hand Bills and by Proclamation at the several Parish Churches that the Question of the Necessity of a General Inoculation would on that Evening, be discussed and determined . . . It was afterwards resolved that in the Consequence of the Opinions given to the Faculty, a General Inoculation does not at present appear necessary. On Monday, the 13th every Gentleman of the Faculty within the Borough with one of the Constables visited the infected Families, and finding the Disorder much wider spread than they had expected, they desired the Constables again to call a Meeting of the Inhabitants which was very numerously and respectably attended – at this Meeting it was determined that a General Inoculation being an Evil much less dreaded than a General Infection, in the Natural Way, which was very likely to take Place within this Town & Neighbourhood, it was solemnly put and carried that 'Circumstances as are at present are, a GENERAL INOCULATION ought to be adopted within the Borough: The Inoculation accordingly commenced the next Day ...' (Razzell, 2003: pp. 115-117)

A similar situation had occurred in Brighton in 1786, when "it also appearing Impossible to Prevent the Infection from Becoming General" a resort to general inoculation took place. (Razzell, 2003: p. 119) This illustrates the difficulty in compelling families to abide by compulsory isolation, and the subsequent resort to a general inoculation to deal with this difficulty. At about the same time, Haygarth attempted to set up a system of isolation in the city of Chester, but this failed as even though his charity offered financial inducements to the poor, they continued to associate with other vulnerable families. (May, 1997: pp. 303, 304)

The History of Smallpox in Sweden.

Davenport, Satchell and Shaw-Taylor have pointed out that smallpox was a young child's disease in Sweden, even though its "population densities were low and settlement pattern dispersed." (Davenport et.al., 2018: p. 75). However, Sweden's geographical location as a continental power had a significant impact on its disease environment.

Sweden was involved in multiple wars with its continental neighbours in the eighteenth century, with Russia, Denmark-Norway, Saxony, the Polish-Lithuanian Commonwealth, Prussia and Hanover. As the *Oxford Companion to Military Histo*ry has pointed out "warfare and disease have always gone hand in hand. Disease affects armies, and armies spread disease."[9] (Holmes, 2001: p. 563) Conscription was compulsory in Sweden, and it organized its army so that "every ten farmsteads were supposed to provide for a fully equipped soldier, including a horse if he was a cavalryman or dragoon ... This system was also used for the navy in coastal areas." (Holmes, 2001: p. 197)

Utterstrom and Lilja provided a summary of the history of infection in Sweden in the eighteenth century as follows:

> The first epidemic of smallpox known to have occurred in Sweden broke out in Malmo in 1736 ... In that year and several following years, wave after wave of epidemics, probably originating on the Continent, passed across the Northern countries ... The wars then in progress – the Swedo-Russian war of 1741-43 coinciding with the War of Austrian Succession (1740-48) on the Continent – helped spread the epidemics ... the increase in the death-rate in Sweden in 1736 and the following years was principally due to various epidemic diseases which appear to have been offshoots of the severe epidemics raging on the Continent ... new pestilences were now introduced by the returning troops – a fact confirmed by county medical officers ...Waves of epidemics passed over Sweden from infected Europe, both from the east and from the west ... The towns around the Gulf of Bothnia were hit by the Russian attacks in the 1710s during the great Nordic war. Several of them were more or less burned down, a few of them several times. (Utterstrom, 1954: pp. 121, 126, 127**;** Lilja, 1994: p. 294)

Skold has provided a focussed discussion of the history of smallpox in Sweden as follows:

> Sweden belonged to an international regime of infection epidemics. Southern Sweden was affected by transmission from Denmark and Germany. The port towns were infected by sailors from other countries. The epidemic which started in Gothenberg in 1823 had its origin in a ship from Amsterdam arriving in May. Smallpox spread to the neighbouring counties of Alvsborg and Skaraborg and when an infected prisoner was sent to Stockholm in November soldiers were infected and the disease spread all over the capital. Stockholm could also expect smallpox to come with travellers from Aland, and island between Finland and Sweden. The western counties north of Halland were reached by smallpox epidemics originating from Norway and northern Sweden

[9] Haygarth pointed out that soldiers were responsible for spreading smallpox in late eighteenth century Chester. (Haygarth, 1784: pp. 188, 189) Similarly Mayhew has referred to at least three epidemics in the sixteenth century were triggered in Rye by returning soldiers from France.' (Mayhew, 1986: p. 160)

suffered several epidemics which came from Finland during the eighteenth and nineteenth centuries. The northern counties of Sweden occasionally reported transmission of smallpox from Russia.' (Skold, 1996: p. 145)

Growing trade with its continental neighbours also exposed Sweden to infection. Increasing population in the small towns of the north and west characterized a period of urban growth, which began around 1750 in response to shifts in Swedish trade patterns from the Baltic to the North Atlantic. Swedish urbanization partly resulted from connections with the European continent. Sweden was part of the European world economy, and the numerous links between Sweden and her continental neighbours created an interdependency that deeply affected and formed the Swedish urban system. (Wikipedia, *History of Sweden*: p. 306; Lilja, 1994: p. 306)

Finland was a part of Sweden in the eighteenth century, and its disease environment was strongly affected by its Russian neighbour: "Russia was the main reservoir of smallpox virus insofar as Finland is concerned ...The reports of the Finnish medical authorities often describe the transmission of smallpox infection in great detail, and they clearly show how important Russia was as a source of the virus. Infection was carried, for example, by the Russian military ..." (Pitkanen K.J., Mielke, J.H. and Jorde, L.B.., 1989: pp. 105, 106).

Conclusion

The evidence presented in this paper confirms Davenport et.al.'s emphasis on avoidance as an explanation of the presence of adult smallpox burials in the south of England. However, this evidence throws doubt on the hypothesis that the age pattern of smallpox in England, Scotland and Sweden was the result of isolation practices introduced at the end of the seventeenth century. The pattern of adult/child smallpox burials in the south of England, and the burial of young children suffering from smallpox in the north appears to have been present as early as the sixteenth century, long before the use of pest houses for isolation of smallpox cases. It is probable that pest houses began to be used for the isolation of smallpox in the late seventeenth century as a result of the increasing virulence of the disease.

In the case of Sweden, its position as a continental power affected its disease environment, with frequent wars and trade flows leading to the importation of smallpox infection.

However, the conundrum remains inasmuch as no satisfactory explanation of the geographical age pattern of smallpox in England currently exists. One clue for its solution lies in evidence of the influence of elite social groups on the avoidance of the disease. Royalty, aristocracy, the gentry and the wealthy in general all appear to have fled from the disease when it occurred, largely because they had the resources to do so. They invariably took their servants with them, along with accompanying tradesmen, creating a culture of disease avoidance in a wide circle of the general population. At a later date these elite groups were the first to adopt inoculation (Razzell, 2003: p. 72; Brunton 1990: p. 230), and the Royal Family had sponsored trials of inoculation which influenced the aristocracy and other elite groups to adopt the practice. This suggests that status, education and knowledge was a key component in the reaction to smallpox.

The south of England was much wealthier than the north, documented by Davenport, Satchell and Shaw-Taylor in their paper. (Davenport et.al., 2018: p. 78) According to Davenport "rural parishes in southern England were on average wealthier than rural parishes in most of northern England as a consequence of longstanding advantages of soil, climate and topography." (Davenport, 2018: p. 14)

We have seen earlier how Henry VIII was forced to leave Wallingford Castle because of the presence of smallpox, and how Elizabeth I kept away from Burghley House because of

the presence of smallpox. There were more than forty palaces and houses owned by Henry VIII, virtually all of them located in the south of England. (Phillips, 2001: p. 8), providing a focus for a culture of disease avoidance. This was not always successful of course, but it is one of the reasons why smallpox afflicted adults as well as children in the south of England. One very detailed account of a royal progress is that made by Henry VIII and Queen Anne in 1535.They made visits to 'evangelical' gentry in the south-west of England in support of the Protestant reformation. The counties visited were in Berkshire, Oxfordshire, Gloucestershire, Wiltshire, Hampshire, Dorset, West Sussex, Surrey, and back to Windsor. The places and houses visited were as follows: Easthamstead, Elvetham, Baring House, The Vyne, Old Alresford, Bishops Waltham, Southampton. Portsmouth, Portchester, Salisbury, Winchester, Hurtsbourne Priors, Thruxton, Wolfhall, Bromham, Little Sodbury, Iron Acton, Thornbury, Berkeley Castle, Gloucester, Tewksbury, Sudeley Castle, Langley, Oxford, Abingdon, Ewelme, Reading. They had intended to visit Bristol but avoided the town on account of the presence of plague. (Starkey, 1991: pp. 118, 121) These places were a mix of urban and rural areas, houses occupied by wealthy families with royal influence, and providing a focus for a culture of disease avoidance.

Although Edward VI, Queen Mary and Elizabeth I did not build new palaces, a number of stately homes – prodigy houses – were built in their honour, and again mainly located in the south and used for annual 'summer progresses' lasting about two months during the sixteenth century. (Phillips, 2001: pp. 8, 9, 91, 113) According to one study, "in the course of her long reign she [Elizabeth I] covered a good deal of southern England, sometimes staying within the Home Counties but often travelling as far as Southampton, Bristol, Worcester, Warwick and Stafford ... she never went to the south west or further north than Stafford."(Dovey, 1996: p. xv) She undertook these progresses 'almost every year' between the beginning of her reign in 1558 and the end of the 1570s, as well as the last four years of her reign. (Dovey, 1996: p. xv)

She took with her whole court, including her privy council, her courtiers and servants, and her retinue consisted of about a thousand people and more. (The Elizabethan Court, Encyclopedia.com: 1) They were preceded or accompanied by an immense baggage train, between 200 or 300 carts, carrying everything necessary for the queen, the court and the council. (Dovey, 1996: p. 3)

According to one account, "The Queen went from house to house in the Home Counties sometimes staying in a palace of her own but more often in the houses of her subjects from national figures to local gentlemen ... The ministers and courtiers who travelled with her were lodged in other houses in the neighbourhood ... The rest of the officials and their servants put up wherever they could, in inns or even in tents ... when stationary the whole train was scattered over a considerable distance." (Dovey, 1996: 3) Another account describes how "one brief stay in Cambridge saw a different department billeted in every college of the university, and a stay at a small residence like Sir William Peter's Ingatestone Hall [in Essex] was a nightmare, not only for the host, but also for the officers, who might find their establishment scattered across miles of countryside, in a dozen different towns and villages."(Loades, 1992: p. 41)

The court went to great lengths to avoid infection. For example, one gentleman usher was sent away for twelve days on full pay because someone had died of the plague on his premises. (Dovey, 1996: pp. 10, 11) Elizabeth's court shared in the European enlightenment's interest in science and new ways of thinking. Its influence was a result of its wealth and was disseminated not only by its presence in a wide range of geographical locations in the south, but the large number of servants and others living among the general population. The influence of royalty and the aristocracy is illustrated by the attraction of the spa at Chalybeate Spring in Tunbridge Wells. According to the plaque celebrating the Spring in Tunbridge

Wells, "Dudley Lord North, a young nobleman discovered the spring in c1606 and taking the waters soon became fashionable. By 1619 'the Wells' had become a popular meeting place for royalty and the aristocracy. By 1676, a flourishing village had grown up around the Spring, with a number of London shopkeepers taking residence along the Upper Walks for the summer season."[10]

Additionally, Parliament, the City of London, the Inns of Court, and the great trading companies concentrated the wealth of England in London and the south of England, providing the means to flee from smallpox when it appeared in these areas.

The age pattern of smallpox in the south and north of England broadly reflects the distribution of support for Parliament in English civil war during 1642-43. (Rank, S.M., Online) This partly reflected strong regional differences in religious affiliation in England as early as the sixteenth century. The Pilgrimage of Grace was a popular uprising that took place in northern England in 1536/37, protesting against the abolition of Catholic ritual, which occurred in Yorkshire, Cumberland, Northumberland, Lincolnshire and Lancashire. (Dodds, 1915; Davies, 1968) Likewise, the northern rebellion of 1569 was associated with the defence of Catholicism in most areas of northern England. (Kesselring, 2007) By contrast, London and the metropolitan counties had developed a significant Protestant culture by the sixteenth and seventeenth centuries. As the puritan Richard Baxter wrote in the middle of the seventeenth century, "I did not believe there was in all the World such a city [as London] for piety, Sobriety and Temperance." (Baxter, 1696, Part 3: p. 17)

The support for Parliament was heavily influenced by the City of London (Pennington, 1968: p. 66, Fisher 1968: pp. 77, 83; Wharton, 1642: Online) which created significant trade and cultural links with city's hinterland. Many of the citizens of London sponsored lectureships in their home parishes (Hill, 1963: p. 95), helping to generate a metropolitan culture in these areas. Richard Baxter wrote about the civil war that "On the Parliament's side were ... the greatest part of Tradesmen ... [and] the reasons which the Party themselves gave was, Because (they say) the Tradesmen have a Correspondency with London, and so are grown to be far more Intelligent sort of Men ..." (Baxter, 1696: p. 30)

London was more literate than elsewhere, with 78 per cent being able to sign subscriptions to the Protestation Covenant in 1642 compared to 30 per cent for the rest of the country. (Cressy, 1980: p. 72) There is also evidence that the elite population in the north were significantly less literate than those in the south. According to Lawrence Stone "in a remote area like Northumberland as late as the 1560s, 92 out of 146 leading gentry were still unable to sign their names, and the M.P. for Berwick was in the same predicament." (Stone, 1965: p. 676) Blood feuds had still lingered in the north of England and Scotland in the sixteenth century (Stone, 1965: p. 228), suggesting that there were significant differences in the culture of the south and north, including amongst their elite populations.

Puritanism was a religion that emphasized "the tremendous responsibility of the individual conscience rather than on outward observance and institutional religion." (Woolrych, 1968: p. 87) Because of their suspicion of ritual and the importance they attached to rationality, the puritans played a major role in the establishment of the Royal Society (Merton, 1957: pp. 584, 585). One of its founding members was the eminent physician Thomas Sydenham, who had strong puritan sympathies and had fought in Cromwell's army during the civil war. (Merton, 1938: p. 24)

Social status, education and knowledge played a role in the reaction to smallpox, including the reduction of opposition to inoculation on religious grounds. (Razzell, 2003: p. 70; Brunton, 1990: p. 230) The royal family had sponsored some of the first inoculations carried out in England (Creighton, Vol. 2, 1965: pp. 468, 469), and knowledge of the nature of

[10] Plaque at the Chalybeate Spring in Tunbridge Wells.

smallpox was influenced by education. This was certainly the case in Finland: “Even during the late nineteenth and early twentieth centuries, the common people often did not realize that smallpox could spread by face-to-face contact. Consequently they did not avoid contact with smallpox patients.” (Pitkanen et.al., 1989: p. 108)

It is probable that the metropolitan culture of the south created a greater awareness of the dangers of disease, and that royalty, the aristocracy, the gentry and the wealthy fleeing smallpox influenced the population living in these southern counties. However, this can only be a provisional hypothesis requiring further detailed research before a solution to the conundrum of the geography of smallpox in England can be fully established.

References

Anselment, R.A., 1989. Smallpox in seventeenth century English literature: reality and the matamorphosis of wit. Med. Hist., 33, pp. 72-95.

Austen, J., 1994. Sense and Sensibility. The Complete Novels. World of Books, London

Behbehani, A.M., 1925. The Smallpox Story. University of Kansas.

Baxter, R., 1696. Reliquiare Baxterianae. London..

Bolton Burial Register, Society of Genealogists, LA/R50.

Brunton, D., 1990. Pox Britannica: Smallpox Inoculation in Britain, 1721-1830. Unpublished Ph.D. Dissertation. University of Pennsylvania.

Calendar of State Papers, Venetian, 25, 1640-42.

Carmichael, A.G., Silverstein, A.M., 1987. Smallpox in Europe before the seventeenth century: virulent killer or benign disease? J. Hist. Med. Allied Sci. 42, pp. 147-168.

Clark, A., 1892. The Life and Times of Anthony Wood Antiquary, 1632-1695, Vol. 1. Clarendon Press, Oxford.

Creighton, C., 1965. A History of Epidemics in Britain, Vols. 1 & 2. Cambridge, C.U.P.

Cressy, D., 1980. Literacy and the Social Order: Reading and Writing in Tudor and Stuart England. Cambridge, C.U.P.

Davenport, R.J., Boulton, J.P., Schwarz, 2011. Urban inoculation and the decline of smallpox in eighteenth-century London. Econ. Hist. Rev. 64 (4), pp. 1289-1314.

Davenport, R., Satchell, M., Shaw-Taylor, L.M.W. 2018. The geography of smallpox in England before vaccination: A conundrum resolved. Social Science and Medicine, 206, pp. 75-85.

Davenport, R., 2018. Cultures of containment? The geography of smallpox in Britain in the pre-vaccination era. Unpublished paper online.

Davies, C.S.L., 1968. The pilgrimage of grace reconsidered, Past and Present, 41.

Dodds, M.H. and R., 1915. The Pilgrimage of Grace, 1536-7, and the Exeter Conspiracy, 1538, 2 Volumes. C.U.P., Cambridge.

Dovey, Z., 1996. An Elizabethan Progress: the Queen’s Journey into East Anglia. Allen Sutton, London.

Duggan et al., 2016, 17th Century variola virus revels the recent history of smallpox. Current Biology, 26: pp. 3407-12.

Duncan, S.R., Scott, S., Duncan C.J., 1993. The dynamics of smallpox epidemics in Britain, 1550-1800. Demography, 30, 3.

Fisher, F.J., 1968. The growth of London, in E.E. Ives (ed.), The English Revolution 1600-1660. Edward Arnold, London.

Forbes, T.R., 1971. Chronicles from Aldgate: Life and Death in Shakespeare’s London. Yale, Yale University Press.

Gardiner, D., 1933. The Oxiden Letters, 1607-1642. London, Constable.
Godber, J., 1969. History of Bedfordshire 1066-1888 (Bedfordshire County Council)
Haygarth, J., 1785. An Inquiry how to Prevent the Small Pox. Chester.
Hill, J.E.C., 1963. Puritans and 'The dark corners of the land' ', Trans. Roy. Hist. Soc., 5th Series, 13.
Holmes, R. (ed.), 2001. The Oxford Companion to Military History. Oxford, O.U.P.
Hopkins, D.R., 1983. Princes and Peasants: Smallpox in History. Chicago, Chicago University Press.
Hutchinson, R., 2014. Mad, bad and dangerous to know: Henry VIII's medical history. History Hub Writing Online.
Kesselring, K.J., 2007. The Northern Rebellion of 1569: Faith, Politics, and Protest in Elizabethan England. Palgrave Macmillan, London.
Leadbeater R.A., 2015, Experiencing Smallpox in Eighteenth-Century England (Ph.D. Oxford Brookes University).
Lilja, S., 1994. Swedish urbanization c 1570-1800. Chronology structure and causes. Scandinavian Journ. of Hist. 19, 4, pp. 277-308.
Loades, D., 1992. The Tudor Court. The Davenant Press, Oxford.
Macfarlane, A., 1970. The Family Life of Ralph Josselin. C.U.P., Cambridge.
May, M., 1997. Inoculating the urban poor in the late eighteenth century. BJHS (Brit. J. Hist. Sci.) 30 (3), pp. 291-305.
Mayhew, G., 1986. Epidemic mortality in 16th century Rye, Sussex Archaeological Collections, 124: pp. 155-77.
Merton, R.K., 1938. Science, Technology and Society in Seventeenth Century England. Humanities Press, New Jersey.
Merton, R.K., 1957. Social Theory and Social Structure. Free Press, New York.
Miller, M. 1957. The Adoption of Inoculation in England and France. University of Pennsylvania Press, Philadelphia.
Monro, A, 1765. Account of the Inoculation of Small Pox in Scotland, in A. Monro (ed.), The Works of Alexander Monro M.D., Edinburgh 1781.
Moody, J. 1996. The Great Burford Small-Pox Outbreak 1758. Hindsight of Burford, Burford.
Pennington, D.H., 1968. The county community at war, in E.E. Ives (ed.), The English Revolution 1600-1660. Edward Arnold, London.
Phillips, C. 2001. The Illustrated Encyclopaedia of the Castles and Stately Homes of Britain and Ireland (Hermes House)
Pitkanen, K.J., Mielke, J.H., Jorde L.B., 1989. Smallpox and its eradication in Finland: Implications for disease control. Popul. Stud., 43, pp. 95-111.
Rank, S.M. English Civil War: Royalist or Parliamentarian, Online.
Razzell, P.E., 2003. The Conquest of Smallpox. Caliban Books, London.
Razzell, P.E., 2011. The decline of adult smallpox mortality in eighteenth-century London: a commentary. Econ. Hist. Rev. 64, 4, pp. 1315-1335.
Razzell, P.E., 2016. Urban inoculation and the decline of smallpox in eighteenth-century cities. (Unpublished paper online peterrazzell.co.uk)
Sherwood, T., 1641. Certaine instructions for the cure of the smallpox, The Charitable Pestmaster or the Cure of the Plague. London.
Skold, P., 1996. The Two Faces of Smallpox: a Disease and its Prevention in Eighteenth and Nineteenth Century Sweden. Report No. 12, Demographic Database Umea: UmU Trckeri.
Smith, J.R., 1987. The Speckled Monster: Smallpox in England, 1670-1970, with Particular Reference to Essex. Essex Record Office, Chelmsford.
Starkey, D. 1991 (ed.). Robert Bell, 'The royal visit to Acton Court', in Henry VIII: A European Court in England. Collier Brown, Greenwich.

Stone, L., 1965. The Crisis of the Aristocracy. O.U.P, Oxford.
Turner J.H. (ed.), 1882. The Rev. Oliver Heywood, 1630-1702, Vol. 1, Brighouse, A.B. Bayes.
Utterstrom, F.L.G., 2011. Some population problems in pre-industrial Sweden. Scandinavian Econ. Hist. Rev., 2, pp. 103-165.
Wharton Letters: 26 September, 1642. Online: posted by Gavin Robinson: 8.0 a.m. 26th September 2012.
Woolrych, A., 1968. The English revolution; an introduction, in E.E. Ives (ed.), The English Revolution 1600-1660. Edward Arnold, London.

The Puritan Tradition in Southwold, Suffolk in the Seventeenth and Eighteenth Centuries.

Peter Razzell

On a Sunday in 1722, Daniel Defoe visited the small coastal town of Southwold in Suffolk, and wrote the following:

> I was surprised to see an extraordinary large church, capable of receiving five or six thousand people, and but twenty-seven in it besides the parson and the clerk, but at the same time the meeting house of the Dissenters was full to the very doors, having, as I guessed from six to eight hundred people in it.[1]

How this situation came about is revealed by the number of Anglican baptisms in the period between 1620 and 1729.[2]

Table 1: Number of Baptisms in Southwold, 1620-1739.

Anglican Baptisms	
1620-29	654
1630-39	736
1640-49	442
1650-59	16
1660-69	28
1670-79	34
1680-89	210
1690-99	181
1700-09	180
1710-19	40
1720-29	64
Non-Conformist Baptisms	
1730-39	147

The reduction in the number of Anglican baptisms occurred from 1640 onwards, at the beginning of the English civil war. There was a slight increase in the period 1680-1709, before a further reduction from 1710 onwards. The overwhelming number of religious independents in 1722 was the result of a long puritan tradition in the town and county, including during the civil war period.[3] The town's religious history has been summarized by the Southwold Museum website as follows:

> Suffolk had for long been known as Puritan country. Chief Justice Wray, in 1556 wrote that 'there were no counties in England so far out of order as Norfolk and Suffolk, the most of them wilful Puritans ... varying in all points from the Book of Common Prayer.' Southwold had a succession of Puritan vicars and Robert Selby had been reported to his Bishop for failing to wear a surplice, anathema to Puritans. The next incumbent was Christopher Youngs, 1611-1626, 'a preacher of God's word', whose children left for New England as a result of religious

[1] Daniel Defoe, *Tour Through England*, Online, Letter 1, Part2: Harwich and Suffolk.

[2] This data was kindly provided by Andrew Wallington-Smith of the Southwold Museum.

[3] For an account of the puritan influence in the town from the early seventeenth century see John Browne, *History of Congregationalism and Memorials of the Churches in Norfolk and Suffolk* (1877), pp. 433=437.

> persecution ... The Town Council paid for the employment of Puritan lecturers, one of whom, Mr Woodward, was '... silenced at the Restoration.' And yet, the congregation at Southwold, 'obdurately inclined to dissent', persisted in their preference for freer forms of worship and an emphasis on preaching.[4]

Southwold was the home of a number of puritan emigrants to the Massachusetts Bay Colony in the 1630s, notably a party of eighteen assembled under Reverend Young, which travelled in the *Mary Ann* in 1637. Richard Ibrook, born in Southwold and a former bailiff of the town, emigrated to Hingham, Massachusetts.[5]

In 1645 the High Steward of the town was Miles Corbet, an active participant in the parliamentary cause. He was 'sent to Ireland by Cromwell in the 1650s, to "settle" affairs there ... and his was the final signature on the death warrant of King Charles I ... On 19 April 1662, with others, he was taken to Tyburn, where he was hung, drawn and quartered.'[6]

One of the leading townsmen, Thomas Postle, who was a merchant, grocer and draper, refused the Oath of Supremacy when elected Bailiff [Mayor] in 1662, and 'was promptly removed from office. But he served as Bailiff twice more in 1671 and 1690, and most of his fellow councillors shared his religious sympathies.'[7] In addition fourteen other townsmen also refused the oath and were expelled from the council. [8]

The town shared the radical history of East Anglia, particularly in coastal and urban areas. This was a part of the North Sea trading community, trading with Holland, Belgium, Iceland and other protestant communities on the continent. Southwold's economy during the seventeenth and eighteenth centuries was largely based on the fishing industry, which involved exports to the continent, as well as Iceland and London. It had acquired a charter in the fifteenth century which established a corporation, in spite of a relatively small population which fluctuated between 1,000 and 2,000 people. Its prosperity had been enhanced by the failure of Dunwich had been a trading port second the only London during the medieval period. This had resulted from the silting up of its harbour, which eventually also affected Southwold.

The town had a population of about 2,000 people in 1654.[9] The economy of the town was revealed by an account of businesses affected by the great fire which occurred in 1659. According to Thomas Gardner these included 'Fish-Houses, Malt Houses, Tuckle Houses, Brew-Houses, and other Out-Houses. Also the greatest Part of the moveable Goods, Nets, and Tackling, of the Inhabitants, for their fishing Trade at Sea, and all their Corn, Malt, Barley, Fish, Coals, and other Merchandizes, Goods, and Commodities.'[10] A description of the economy in the late 1660s concluded that 'the chief business of the Town is for Sea affairs ... The chief trade is to Iceland and the North-sea for Codd; they also have a Coal-trade, and a great passage trade to London with cheeses and butter; they have also something to do in Ship-building, and refining of salt.'[11]

Why did Southwold became a centre of intense puritanism? The answer can only be found in the context of general developments during the civil war in England. Clarendon concluded that the chief opposition to the king lay in 'great towns and corporations ... not only the citizens of London ... but also the greatest part of all cities

---

[4] The heading of Christianity in the Southwold Museum Website.
[5] *Wikipedia Southwold*.
[6] L,M, West, *This Fearful Thing*, 2021, pp. 246, 247.
[7] Simon Loftus, *An Illustrated History of Southwold*, 2018, p. 15.
[8] Thomas Gardner, *Historical Account of Dunwich, Blythburgh and Soutwold*, 1754, pp. 194, 195.
[9] Gardner, *Historical,* p.212.
[10] Ibid, p. 194.
[11] Loftus, *An* Illustrated, p. 14.

and market towns of England.'[12] The role of tradesmen in the civil war was confirmed by Parker, in his *Discourse of Ecclesiastical Polotie* published in 1671: 'For 'tis notorious that there is not any sort of people so inclinable to seditious practices as the trading part of a nation.'[13]

Part of the reason for the puritanism of the trading classes was their independence from manorial control. In nucleated villages in fielden areas 'manorial customs [were] fairly rigid ... the labourers outlook deeply imbued with the prevalent preconceptions of church and manor house ... In isolated hamlets ... the customs of the manor were sometime vague or difficult to enforce ... In these areas [the population was] more prone to pick up new ways and ideas.'[14] Geographical isolation was an important factor in generating an independent culture. According to Southwold Museum website, 'Southwold has long tradition of independence which has inspired fierce loyalty, independence even from the crown ... the town's location is characterised ... by the waterways that surround it on every side. Almost an island ...'[15]

According to the Compton Census of 1676 dissenters were 'mostly found in towns with a strong puritan tradition, in centres of the cloth industry, and in places where the social and residential structures created conditions favourable to religious individualism.'[16] The Evans list of English dissenters made in about 1718, indicated that 63 per cent of Presbyterians, 69 per cent of Independents, 58 of Particular Baptists and 61 per cent of General Baptists worshipped in cities, boroughs or market towns.'[17] One contemporary account claimed that 'the growth of Puritanism ... was by means if the City of London ... by reason of its universall trade throughout the kingdome, with its commodities conveying and deriving this civil contagion to all our cities and corporations.'[18]

The puritan divine Richard Baxter explained why tradesmen were attracted to puritanism: 'among merchants, mercers, drapers and other corporation tradesmen ... there is usually more knowledge and religion than among the poor enslaved husbandman. I may well say *enslaved:* for more are so servilely dependent ... as they are on their landlords. They dare not displease them lest they turn them out of their houses, or increase their rents.'[19] Baxter claimed that the reason that tradesmen and artisans were such strong supporters of Parliament was as follows: 'The Reasons which the Party themselves gave was Because (they say) the Tradesmen have a Correspondency with London, and so are grown to be far more Intelligent sort of Men.'[20]

Southwold was part of East Anglia, which historically was noted for its independence and puritanism. As a fishing and trading town, it was isolated from any manorial control, and traded with the Continent of Europe and London, It was a strong supporter of the puritan movement from the civil war period onwards, both supporting Parliament, and establishing a long history of religious dissent.

[12] Peter Razzell, *Essays in Historical Sociology*, 2021, p. 102.
[13] Razzell, *Essays*, p. 103.
[14] Ibid, p. 67.
[15] Southwold Museum Website
[16] Razzell, *Essays*, p. 111.
[17] Michael Watts, *The Dissenters*, p. 285.
[18] Razzell, *Essays*, p. 105.
[19] Ibid, p. 113.
[20] Ibid, p. 103.

A Sociological Analysis of the English Civil War.

Geography and the Civil War in England.

England experienced the growth of capitalism earlier than most European powers, which along with the prevalence of individual freedom, is central for an understanding of the civil war. Luciani Pellicani in his discussion of the history of capitalism, has emphasized the importance of political and military constraints on personal freedom:

> The *consumer's freedom* is as essential for the functioning of capitalism as the *entrepreneur's freedom* ... The emancipation of the urban communities marks the beginning of the genesis of modern capitalism. Its roots are political and military, not economic. Cities were able to inject dynamism and rationality into the stagnant rural world only to the extent to which they succeeded in withdrawing from the effective jurisdiction of their lords and the spiritual control of economic obscurantism centred around the condemnation of profit and trade. They were successful precisely because they were opposed by a crumbling public power, lacking as never before the military and financial means to compel its subjects to obedience.[1]

Max Weber gave several reasons why England differed from continental powers: 'As a result of its insular position [as an island] England was not dependent on a great standing army.' On the continent it was possible for the state to protect its peasantry through its standing army, but in England this was not possible. As a result, England 'became the classical land of peasant eviction. The labour force this threw on the market made possible the development of the domestic small master system ... Thus while in England shop industry arose, so to speak, by itself, on the continent it had to be deliberately cultivated by the state ... This is by no means fortuitous, but is the outcome of continuous development over centuries ... the result of its [England's] insular position.'[2]

The argument that these changes occurred as a result of 'a continuous development over centuries' is consistent with Alan Macfarlane's thesis that 'the majority of ordinary people in England from at least the thirteenth century were rampant individualists, highly mobile both geographically and socially, economically "rational", market-oriented and acquisitive, ego-centred in kinship and social life.'[3] This indicates that English individualism existed well before the late fifteenth century, which is when most historians have dated the emergence of capitalism in England.[4] This suggests that something fundamental in English society – 'its insular position' – was responsible for this cultural development.

England's geographical situation as an island meant that it was relatively free from the wars occurring on the continent, relying mainly on a navy for defence and resulting in periodic recruitment of militias rather than the establishment of a permanent army. France, Germany and most continental powers were vulnerable to military attack because of the threat from other land based societies, and therefore were forced to develop armies in order to survive. According to Jane Whittle

---

[1] L. Pellicani, *The Genisis of Capitalism and the Origins of Modernity*, 1994, pp. 10, 123.
[2] M. Weber, *General Economic History*, 1961, pp. 129, 130; M. Weber, *Theory of Social and Economic Organization*, 1964, p. 277.
[3] A, Macfarlane, *The Origins of English Individualism*, 1978, p. 163.
[4] Ibid, pp. 34-48.

> The lack of prosperity [in France was due to] ... the wars conducted on French soil from the fourteenth to the sixteenth centuries, and the heavy royal taxation to which French peasants were subjected from the late fifteenth century onwards ... That English peasants were not subjected to a similar level of taxation was not a matter of chance. There were rebellions against taxation in 1489, and 1497 and 1525, as well as 1381 ... Yet because of the low level of taxation, English governments could not afford to keep a standing army to put down these rebellions.[5]

Whittle does not explain the relative success of rebellions in England, and why it was so difficult to suppress them. The absence of a permanent national army was the result of England's geographical position as an island, not allowing it as in France, to introduce high taxes. This resulted in a vicious circle: no standing army, low taxation, no standing army.

The exceptions to the vulnerability of continental powers were Holland and Venice, which were protected from attack by their geographical location. In the case of Holland, the canals and marshes allowed them to create flood barriers against enemies, and they established a Water Line in the early seventeenth century which was used to almost transform Holland at times into an island. The Water Line was used for example in 1672, where it prevented the armies of Louis XIV from conquering Holland.[6] Venetian power was derived from its fleet and linked military forces, and its control of its lagoons provided protection from military attacks.[7] It is perhaps no accident that both states became republics with early forms of capitalist development, illustrating Pellicani's thesis about the centrality of military and political factors in creating the freedoms necessary for entrepreneurial growth.

The lack of a permanent national army in England meant that the English crown, as well as the aristocracy, was dependent on the population at large for the creation of military force.[8] This absence of a standing army made it difficult for the government to impose taxes, and eventually resulted in the development of markets relatively free of political and military control. England's reliance on its navy for defence included its merchant fleet – and this partly explains its active involvement in world trade, an important dimension in the growth of English capitalism.

There were also important internal geographical factors associated with the development of capitalism in England. It was a country with plentiful coal and iron deposits, internal rivers and good coastal harbours, and a location between Europe and the Americas. However, there were internal environmental conditions which also facilitated the growth of individual freedoms:

> ... [there was] a growing distinction between working communities in forest and in fielden areas. In the nucleated villages characteristic of the latter ... manorial customs [were] fairly rigid, political habits comparatively orderly, and the labourer's outlook deeply imbued with the prevalent preconceptions of church and manor-house. In these fielden areas labourers often ... more or less freely [accepted] their dependence on squire and parson ... In the isolated hamlets characteristic of forest settlements ... the customs of the manor were sometimes vague or difficult to enforce ... and the authority of church and manor house seemed remote. In these areas [the population was] ... more prone to pick up new ways and ideas. It was primarily in heath and forest areas ... that the vagrant religion of the Independents found a footing in rural communities.'[9]

---

[5] J. Whittle, *The Development of Agrarian Capitalism: Land and Labour in Norfolk 1440-1580*, 2000, pp. 18, 19, 311.
[6] Wikipedia: *Dutch Water Line.*
[7] Wikipedia, *Military History of the Republic of Venice.*
[8] Ibid, pp. xvii-xx, 3-37.
[9] A. Everitt, 'The marketing of agricultural produce' in J. Thirsk, *The Agrarian History of England and Wales, 1500-1640*, 1967, pp. 462, 463. See also the discussion of the contrast between pastoral and arable areas in D. Underdown, *Revel, Riot & Rebellion: Popular Politics and Culture in England 1603-1660*, 1987, p. 5; J. Thirsk, 'The farming regions of England' in Thirsk, *The Agrarian History*, p. 14; K.

The areas outside of manorial control consisted 'mainly of towns, the pasture and woodland areas linked to an expanding market economy, and the industrializing regions devoted to cloth-making, mining, and metal-working ...'[10] Many of these districts were 'perceived as being a lawless ... Few gentry families lived there to supervise the behaviour of the "common" people and ... [they] proved to be one of the areas of considerable religious independence and dissent.'[11]

Given the importance of the cloth industry in England, the support of clothing districts for parliament was a key factor in the civil war.[12] The attempts at political control by Charles I extended to the power of the guilds, which were seen by him, along with monopolies, as 'one of the traditional instruments of industrial control'.[13] However, much economic development took place in rural areas, where the power of the guilds was progressively weakened:

> ... during the thirteenth century there was an increasing shift of industry away from urban areas to the countryside. ... The growth of the rural cloth industry was partly enabled ... by a rural location ... [which] permitted cloth producers to take advantage of cheap labour away from the prohibitive restrictions of the guilds ... the very existence of craft guilds or endeavours to establish them might encourage merchants to transfer their entrepreneurial activities to the countryside. Textile skills were traditional there and rural overpopulation made labour available ... [14]

The Role of Armies on the Political Development of France and England.

In order to fully understand the civil war in England it is necessary to compare it with events in France during the sixteenth and seventeenth centuries. The French 'Wars of Religion' were a period of war between Catholics and Huguenots in France in the latter half of the sixteenth century. This included the destruction of images in Catholic churches, which resulted in Catholics attacking Protestants, including the St. Bartholomew's Day massacre in 1572.

Correlli Barnet contrasted the military developments in England, France and Germany during the sixteenth and seventeenth centuries as follows:

> An army had indeed been 'standing' in France almost continuously throughout the sixteenth century; an emergency force to meet continuous emergency. Since 1569 there had been permanent regiments of native-born infantry. France's rise to greatness as a modern military power dates, however, from about 1624, during Cardinal Richelieu's administration ... In 1628 the twelve oldest regiments were given a permanent status ... By 1635, when France entered the war [the Thirty Years War], she had five field armies numbering 100,000 men, including 18,000 horsemen ... Men were now to be paid not by their captains but by state commissioners, one per regiment ... In France under Louis XIII and Richelieu royal authority rested on the army – in the 1630s and 1640s taxes

---

Wrightson, *English Society, 1580-1680,* 1982, p. 171; S. B. Jennings, *The Gathering of the Elect: The Development, Nature and Socio-economic Structures of Protestant Religious Dissent in Seventeenth Century Nottinghamshire.* (D.Phil. Thesis, Nottingham Trent University), p. 270.

[10] Underdown, *Revel*, p. 18.

[11] Jennings, *The Gathering,* p. 17.

[12] Underdown, *Revel*, pp. 220, 231-32, 275-78; J. Morrill, *The Nature of the English Revolution,* 1993, p. 235.

[13] R. Ashton, 'Charles I and the City', in F.J. Fisher (ed.), *Essays in the Economic and Social History of Tudor and Stuart England*, 1961, p. 145; L. Stone, *Causes of the English Revolution, 1529-1642*, 1986, p. 126

[14] P.T.H. Unwin, 'Town and trade 1066-1500' in R.A. Dodgson and R.A. Butlin (eds.), *An Historical Geography of England and Wales*, 1978, p. 136.

> were even collected by armed force. In Germany, where some states enjoyed greater formal powers than the English Houses of Parliament, the princes could plead the emergency of the Thirty Years War to make a convincing case for emergency taxation on royal authority and for raising standing armies ... [15]

Fourteen regiments of the French Army were used to persecute the Huguenots, the major Protestant group in France. Louis XIV instituted a campaign of harassment, which included the occupation and looting of Huguenot homes by military troops, attempting to forcibly convert them. In 1685, he issued the Edict of Fontainebleau, revoking the Edict of Nantes and declaring Protestantism illegal. Huguenots made up to as much as ten per cent of the French population; but by 1685 it had reduced to no more than 1,500 people.[16]

The impact of the suppression of the Huguenots and the control of French society by the military has been summarized by Hatton:

> the monarchy followed the policy of state support, regulation and economic control ... To live nobly, in other words in the manner of the nobility, idly without following a trade or craft, was in itself a claim to honour and social esteem. Colbert and his contemporaries did not realise the advantages which would derive from a general system of freedom of labour.[17]

The incidence of taxation was very high in France, but by contrast the level of taxation in England before the civil war resulted in the emergence of an independent group of prosperous yeomen, artisans and traders.[18] The presence of royal troops in France led to the decimation of the rural population, described by Sir John Fortescue in an account written as early as the 1460s, and summarized by Perry Anderson as follows:

> ... Sir John Fortescue, Lord Chancellor to King Henry VI, fled into France with Henry in 1461 and during the next ten years of exile he wrote his *Learned Commendation of the Politique Laws of England* ... Fortescue noted the oppressions of the rural population by royal troops in France ... 'so that there is not the least village there free from this miserable calamity, but that it is once or twice every year beggared by this kind of pilings (pillage).' This and other exactions, such as the salt tax, led to great poverty of the rural inhabitants which Fortescue observed around him ... In England, on the other hand, the position of rural inhabitants was very different. The absence of heavy taxation, of billeted soldiers, and of internal taxes, meant that 'every inhabiter of that realm useth and enjoyeth at his pleasure all the fruits that his land or cattle beareth, with all the profits and commodities which by his own travail, or by the labour of others he gaineth by land or by water ...' Neither are they sued in the law, but only before ordinary judges, whereby the laws of the land they are justly intreated.[19]

A similar account was given by John Aylmer, later Bishop of London, who lived in exile on the continent and in 1559 published a pamphlet entitled *An Harborowe for Faithfull and Trewe Subjects*. He claimed that the impoverishment of the rural French population was due to the frequency of wars – 'as they are never without it' – resulting in the king's soldiers entering 'the poor man's house, eatheth and drinketh up all that he ever hath'.[20]

Correlli Barnett has summarized the role of the army on political developments in England during the outbreak of the civil war:

---

[15] C. Barnett, *Britain and Her Army, 1509-1970*, 1970, pp. 69-73.
[16] Wikipedia Huguenot.
[17] R. Hatton (ed.), *Louis XIV and Absolutism*, 1976, pp. 227, 240.
[18] T.H. Aston and C.H.E. Philpin, *The Brenner Debate: Agrarian Class Structure and Economic Development in Pre-Industrial Europe*, 1987, p. 89.
[19] P. Anderson, *Lineages of the Absolute State*, 1974, pp. 179-181.
[20] Ibid, p. 178.

> In England ... Charles I endeavoured from 1629 to free himself from the Commons' control over taxation by virtually abandoning any foreign policy, with all its implications in terms of costly armies. However, he could not then plead national emergency to raise an army. The Commons were well aware of the danger to their position which a royal army would represent ... No funds were available to pay an army ... Charles had nothing except the militia system ... [21]

As a result of an absence of a permanent national army, Charles was unable to arrest the rebellious five Members of Parliament, precipitating the civil war. Thomas May's two publications, issued in 1647 and 1650 ... [claimed] 'what the parliamentarians were defending, as they saw it, was the ancient constitution, the common law which had existed (so Coke said) since time immemorial, and the rights and liberties of all free-born Englishmen,'[22] which Levellers and other radicals believed had been subverted by the Norman Conquest. Sir John Strangways writing in the Tower in the 1640s concluded 'that if the gentry were not universally Anglican high-flyers, neither were they supporters of any supposed scheme to establish a despotism on the French model – most of the Cavalier gentry were as attached to the liberties of the ancient constitution as their old enemies had been.'[23] This emphasis on civil liberties rather than religion was confirmed by Cromwell when he said that at the beginning of the civil war 'religion was not the thing first contended for, but God hath brought it to that issue at last.'[24]

The Political History of London.

The City of London was by far the biggest urban area in England, and became one of the largest cities in Europe. It was the capital of a major sea power, and through its trade had grown immensely powerful. This was illustrated by the Venetian ambassador when he 'reckoned that twenty thousand craft, small and great, were to be seen from London in a day.'[25] (p. 30)

It was relatively immune from the control of the monarchy because of the crown's lack of a standing army. Also, its inland geographical location in the Thames gave it a degree of protection from outside invaders. Its population had grown rapidly during the late sixteenth and seventeenth centuries, reflecting its commercial and financial success and growth.

Table 1: Estimated Population Size of London, 1520-1700.[26]

Approximate Date	Estimated Population of London	Period	Annual Percentage Increase	Estimated Population of England	London's Population as a Proportion of England's Population
1520	55,000			2,600,000	2.1%
1600	200,000	1520-1600	3.3%	4,300,000	4.7%
1650	400,000	1600-1650	2.0%	5,250,000	7.6%

[21] Barnett, *Britain and Her Army*, pp. 69-73.
[22] R. Richardson, *The Debate on the English Revolution*, 1998, p. 15.
[23] Underdown, *A Freeborn*, p. 115. See also Harold Perkin, *The Origins of Modern English Society, 1780-1880*, 1969, pp. 52, 53.
[24] Morrill, *The Nature*, p. 394.
[25] C.V. Wedgewood, *The King's Peace, 1637-1641*, 2001, p. 30.
[26] P. Razzell and C. Spence, 'The history of infant, child and adult mortality in London, 1550-1850', *London Journal,* Volume 32, p. 25.

1700	575,000	1650-1700	0.9%	5,100,000	11.3%

In 1650 towns with a population of over 10,000 numbered a total of 494,000 people in England, of which about 400,000 – 81% – were living in London.[27] This indicates the overwhelming importance of London in the civil war, dominating the urban landscape and its support for parliament.

Historically, London had formed the centre of opposition to the crown's attempts to control the country through its use of the prerogative. As early as the tenth century the City resisted the invasion of the Danes through its defensive fortifications and its military power:[28] Later in the twelfth century Fitz-Stephen described in some detail the military strength of London:

> ... the city mustered, according to estimation, no less than sixty-thousand foot and twenty thousand horse ... the city was possessed of very considerable military strength, the only efficient source of power in those days ... its wall was strong and lofty, adorned with seven gates, and having all along the north side turrets at equally distances. Within it and its immediate suburbs were ... one hundred and twenty-six parish churches.[29]

London formed alliances with barons and others in conflict with the crown, but also supported the crown on occasions, and because of its financial and military power this formed the basis of the City's relative independence and autonomy.[30]

Under a Royal Charter of 1067 the crown had granted London certain rights and privileges, which were confirmed by Magna Carter. These privileges were given on the basis of loans and taxes that the City granted to the crown. However this charter and later ones were frequently abolished by the crown, often requiring major loans and taxes in order to obtain renewals.[31]

The Role of London in the Civil War

> London was seen by contemporaries during the civil war as the chief centre of resistance to the crown. Clarendon called London 'the sink of the ill-humours of this kingdom',[32] and a royalist writer declared: 'If (posterity) should ask who would have pulled the crown from the King's head, taken the government off the hinges, dissolved Monarchy, enslaved the laws, and ruined their country; say, 'twas the proud, unthankful, schismatical, rebellious, bloody City of London.'[33] The Venetian ambassador in one of his summaries of events in the civil war claimed 'London was the chief and most determined hot bed of the war against the King. Countless treasure was poured out of the purses of private individuals for the support of their armies. The goldsmiths alone are creditors for a loan of 800,000 crowns made to Parliament ...'[34]

[27] M. Anderson (ed.), *British Population History*, 1996, p. 122.
[28] G. Norton, *Commentaries on the History, Constitution and Chartered Franchises of the City of London*, 1829, p. 29.
[29] Ibid, pp, 76, 83.
[30] Ibid, pp. 75, 156, 158, 204, 211.
[31] Ibid, pp. 70, 96, 97, 115, 156, 157, 282.
[32] V. Pearl, *London and the Outbreak of the Puritan Revolution: City Government and National Politics, 1625-43,* 1961, p. xi; see also T. Hobbes, *English Works,* Volume VI, 1839-45, pp. 191-92.
[33] Pearl, *London,* p. xi.
[34] E. and P. Razzell (eds.), *The English Civil War: A Contemporary Account,* Volume 5, 1657-1675*, Relatzione of England by Giovanni Sagredo,* 1656, p. 4.

London was the biggest manufacturing centre of England during the sixteenth and seventeenth centuries, much of it in the suburbs beyond the control of the City authorities:

> From at least the early sixteenth century ... there had been a tendency for domestic industry to establish itself in the suburbs where it was often possible to escape the powers and penalties of the livery Companies. By 1600, nearly all the leatherworkers and makers of felt hats had left the city and were living in Bermondsey, Southwark and Lambeth ... Many of the newer industries of the period were being attracted to the liberties and out-parishes: sugar-refining and glass-making around Stepney and Islington, alum and dye works to the north and east of the city, and copper and brass mills at Isleworth. Large-scale industrial enterprises, such as ship-building at Rotherhithe and Deptford, and brewing in Clerkenwell and Holborn, were also migrating to the suburbs. There were older industries too: brick-and tile-making in the northern outskirts ... clock-making in Holborn and Westminster; bell-founding in Whitechapel; paper-making in Middlesex, while St. Giles, Cripplegate, was crowded with artisans of the weaving, printing and paper-making trades. Thomas Mun, writing in the sixteen-twenties, described the concentration of workers in the silk industry and recalled how in the past thirty-five years, the winding and twisting of imported raw silk, which previously had not more than 300 in the city and suburbs, had now 'set on work above fourteen thousand souls'. The great majority of these would have been workers in the outskirts of London.[35]

These manufacturing areas included Southwark which had long been an area beyond the control of the City – brothels, bear baiting and illegal theatrical productions[36] – but also attracted unregistered artisans and foreigners who brought with them a range of industrial skills:

> The more the city became the commercial centre of England, the more the actual industries moved beyond the walls. The poorer craftsmen who did not have the money to set up shop within the city, and the 'foreigners' or unfree men – often including aliens – who were not qualified to do so, not having served an apprenticeship, tended to settle in the suburbs. Over such recalcitrant workers the [guild] companies found it difficult to assert any control, even when empowered to do so by statute or charter.[37]

This was partly the result of the growth of London's population, which undermined the capacity of the City authorities to regulate industry in the suburbs.[38] The City authorities attempted to exonerate itself from blame for the disorders in the City, writing to the king that 'many of the trouble-makers, they thought, came from the unregulated and disorderly suburbs' which were beyond their control.[39] The radicalism of the suburbs was displayed in 1647 when the inhabitants of Southwark opened the gates of London Bridge to Fairfax's army, resisting the City's attempt to oppose the New Model Army. [40]

Given London's high mortality rate, much of its growth was fuelled by migration from elsewhere in Britain. One of the best sources for data on migration is apprenticeship records. According to Brian Manning, most apprentices were 'of good parentage' whose families 'lived honestly and thriftily in the country.'[41] Only a minority of apprentices came

---

[35] Pearl, *London*, p. 16.
[36] Anonymous, *The City Laws Showing the Customes, Franchises, Liberties, Priviledges, and Immunities of the Famous City of London,* 1658.
[37] D.J. Johnson, *Southwark and the City*, 1969, p. 313.
[38] P. Wallis, 'Controlling commodities: search and reconciliation in the early modern livery companies', in I.A. Gadd and P. Wallis (eds.), *Guilds, Society and Economy in London, 1450-1800*, 2002, p. 87.
[39] Pearl, *London*, p. 129.
[40] Ibid, p. 28.
[41] B. Manning, *Aristocrats, Plebeians and Revolution in England, 1640-1660,* p. 89.

from London and the cosmopolitan nature of the City meant its population came from all areas of the country and with fathers in all occupational groups.[42] The majority of apprentices were from 'middle sort' backgrounds, and it was this group who provided the main support for parliament in London.[43]

Table 2 Numbers of Occupations and Number from London.[44]

Occupation of Father	*Total Number*	*Fathers Residing in London*	*% Fathers Residing in London*
Gentlemen, Esquires & Clerks	33	2	6%
Yeomen	51	0	0%
Artisans. Tradesmen & Merchants	90	38	42%
Husbandmen & Labourers	26	2	8%
Total	200	42	21%

As C.V. Wedgewood observed: 'In all the larger towns, and above all in London, the short-haired apprentices who thronged about the place counted among their number gentlemen's sons, yeomen's sons, the sons of professional men and of citizens ... all were alike apprentices, and common interests, hopes and pleasures broke down the barriers of inheritance.'[45] This illustrates the importance of social structures in unifying disparate individual differences, an important factor in the communities involved in the civil war.

London was both cosmopolitan in the origins of its residents, but also in its high degree of literacy. Evidence produced by David Cressy indicates that seventy per cent of men in England were unable to sign their names in 1641-42, whereas this was true of only twenty-two percent of Londoners, suggesting 'that the capital may have provided a uniquely literate environment.'[46] This high level of literacy was partly associated with the occupational structure of London, as indicated by Table 3.

Table 3 *Social Structure of Illiteracy in the Diocese of London, City and Middlesex, 1580-1700.*[47]

Fathers Occupation	Number Sampled	Proportion Signing With A Mark
Clergy & Professionals	168	0%
Gentry	240	2%
Apprentices	33	18%
Tradesmen & Craftsmen	1,398	28%
Yeomen	121	30%
Servants	134	31%
Labourers	7	78%
Husbandmen	132	79%

[42] For data on migration patterns of apprentices see Razzell and Spence, 'The history', p. 27. For confirmation of the very high levels of in-migration to London in the seventeenth century see V.B. Elliott, *Mobility and Marriage in Pre-Industrial England*, Cambridge University Ph. D thesis, 1978.
[43] B. Manning, *The English People and the English Revolution*, 1991.
[44] Data from Cliff Webb, *London Livery Apprenticeship Registers*, Volumes 2, 33, 43 and 48, tylers & bricklayers, plumbers, vintners, grocers. First 50 cases were selected from each volume, 1640-1660
[45] Wedgewood, *The King's Peace*, p. 52.
[46] D. Cressy, *Literacy and the Social Order: Reading and Writing in Tudor and Stuart England,* 1980, p. 72; see also P.S. Seaver, *Wallington's World: A Puritan Artisan in Seventeenth Century London*, 1985, p. 5.
[47] Cressy, *Literacy*, p. 121.

Women	1,794	76%

There was a significant difference in the high literacy of the gentry, professionals, tradesmen & craftsmen on the one hand – who were in a majority in the sample – and the low literacy of husbandmen, labourers and women on the other.

London not only provided the bulk of the money, supply of weapons, ammunition, uniforms and other military equipment for parliament,[48] but in the early stages of the war also the majority of its soldiers from its trained bands.[49] As Clarendon wrote of the Battle of Edgehill, 'the London train bands, and auxiliary regiments ... behaved themselves to wonder, and were in truth the preservation of that army that day ...'[50] London not only supplied the bulk of the trained parliamentary troops, but also the City was central to the beginning of the war through its participation in mass demonstrations of parliament, as well as creating petitions for political and religious reform. [51] These demonstrations occurred virtually every day, constantly lobbying parliament in a threatening way.[52] The population also demonstrated through its actions its opposition to the crown and support of parliament:

> In a desperate attempt to redeem his abortive coup, Charles went down to the city on 5 January [1642]. 'the people crying 'Privilege of Parliament' by thousands ... shutting up all their shops and standing at their doors with swords and halberds ... the city was now in mortal fear of the king and his cavaliers. A rumour the next evening that Charles intended to fetch out his victims [five Members of Parliament] by force brought huge crowds into the streets, with whatever arms they could lay their hands on: women provided hot water to throw on the invaders, stools, forms and empty tubs were hurled into the streets 'to intercept the horse' ... the truth was dawning in Whitehall, between 4 and 10 January, that, for all their swashbuckling of the cavaliers and the protestations of young loyalists at the Inns of Court, the king had lost control of his capital.[53] The five members ... together with Viscount Mandeville [who the king attempted to arrest], embarked at the Three Cranes ... there was a fleet of boats, armed with muskets and ordnance ... Trumpets, drums and martial music accompanied the MPs all the way to Westminster ... More than 2000 men in arms and citizens thronged Westminster Hall ... [54]

The Venetian ambassador claimed in July 1643 that 'the support of this war rests upon the city alone ... [It] has already usurped practically absolute power. They have formed a council for the militia, composed of citizens with supreme authority to do what is considered necessary for self defence while, for the equipment of the Army and its despatch, they are raising money and men ...'[55] It was the absence of a standing army which led to the failure of Charles I to force parliament to comply with his demands, leading to his failure to arrest the five members in 1642. He was unable to force Londoners to reveal their whereabouts, and London turned out to be the chief centre of resistance to royal control.

The Venetian ambassador argued that the Puritans owed their success in the Short Parliament elections to their achievements in 'Swaying the Common votes', and Thomas

---

[48] S. Porter and S. Marsh, *The Battle for London*, 2010, p. 41.
[49] J. Morrill (ed.), *Reactions to the English Civil War, 1642-1649,* 1982, p. 19.
[50] E. Hyde, Earl of Clarendon, *The History of the Rebellion and Civil Wars in England Begun in the Year 1641*, Volume 3, 1888, pp. 174, 175.
[51] Fletcher, *The Outbreak*, p. 128; See also R Ashton, *The City and the Court, 1603-1643*, 1979, p. 220.
[52] E. And P. Razzell (eds.), *The English Civil War: A Contemporary Account, Volume 2: 1640-42*, 1996, p. 142.
[53] Fletcher, *The Outbreak*, p. 182.
[54] Ibid, p. 185. See Manning, *Aristocrats*, pp. 34-36 for a discussion of the role of London citizens in support of parliament.
[55] E. And P. Razzell (eds.), *The English Revolution: A Contemporary Study of the English Civil War*, 1999, p. 194.

Hobbes more or less concurred, asserting that 'tradesmen, in the cities and boroughs ... choose as near as they can, such as are most repugnant to the giving of subsidies'.[56]

This illustrates Pellicani's thesis about the role of towns and urban areas in injecting 'dynamism and rationality into a stagnant rural world', and laying the foundation for parliamentarian opposition to the crown. The Venetian Ambassador on the 24th January 1642 gave a further account of the popular support for parliament in London,[57] and on the 7th November described how the Londoners erected barriers to protect the City against the royalist army: 'There is no street, however little frequented, that is not barricaded with heavy chains, and every post is guarded by numerous squadrons. At the approaches to London they are putting up trenches and small forts of earthwork, at which a great number of people are at work, including the women and little children.'[58] On the 15th May the following year, the ambassador described the completion of these fortifications:

> The forts round this city are now completed and admirably designed. They are now beginning the connecting lines. As they wish to complete these speedily and the circuit is most vast, they have gone through the city with drums beating, the flag flying to enlist men and women volunteers for the work. Although they only give them their bare food, without any pay, there has been an enormous rush of people, even of some rank, who believe they are serving God by assisting in this pious work, as they deem it.[59]

This was a revolutionary moment demonstrating fierce and violent opposition to the crown. This moment has been described in detail by Pearl as follows:

> At the order of the Common Council, pulpits were to resound with the call to defend the city. Ministers were to 'stir up the parishioners' to complete the fortifications with the aid of their children and servants ... It is not surprising that Pennington's wife, the Lady Mayoress, was there (armed with an entrenching tool, said a Royalist ballad) – we have already encountered her staunch Puritanism. But ladies of rank were also present, as well as fish wives who had marched from Billingsgate in martial order headed by a symbolic goddess of war ... Columns with drums beating and flags flying were sent through the city to recruit more volunteers until 20,000 persons, it was said, were working without pay, drawing only their rations ... The work was allocated by whole parishes, and different trades and Livery Companies, who marched out with 'roaring drums, flying colours and girded swords': over fifty trades were said to have competed in friendly emulation: one day it was 5,000 Feltmakers and Cappers with their families: the next almost the entire Company of Vintners with their wives, servants and wine-porters; on another, all the 2,000 city porters 'in their white frocks', followed by 4,000 of 5,000 Shoemakers, a like number from St. Giles-the-Fields and thereabouts, and the entire inhabitants of St. Clement Dane. In this astonishing manifestation of unity, even the 'clerks and gentlemen' participated as a profession. Those belonging to Parliament, the Inns of Court, and other public offices, were mustered in the Piazza in Covent Garden at seven o'clock in the morning with 'spades, shovels, pickaxes and other necessaries' Popular enthusiasm for the fortifications could reach no higher pitch. Whatever the military value of the defences, the successful mobilization of a great mass of the ordinary people proved the power of parliamentary puritan organization and leadership ... The city had been united in one desire – London should not become a battlefield.[60]

---

[56] D.. Hirst, *The Representative of the People? Voting in England under the Early Stuarts*, 1975, p. 68. See also Morrill (ed.), *Reactions*, p. 70 for a discussion of the support of trading cities for parliament and the support of cathedral cities for the crown.
[57] Razzell, *The English Civil War,* Volume 2, 1640-42, p. 169.
[58] Razzell, *The English Revolution*, p. 173.
[59] Ibid, p. 188.
[60] Pearl, *London*, pp. 264, 265.

London also had a major influence on provincial towns and urban areas. Clarendon concluded that the chief opposition to the king lay in 'great towns and corporations ... not only the citizens of London ... but also the greatest part of all other cities and market towns of England.'[61] This was mainly through trading links, as described by the Puritan clergyman Richard Baxter in his discussion of the support of tradesmen and artisans for parliament: 'The Reasons which the Party themselves gave was, Because (they say) the Tradesmen have a Correspondency with London, and so are grown to be far more Intelligent sort of Men ... '[62] The role of tradesmen in the civil war was confirmed by Parker, in his *Discourse of Ecclesiastical Politie* published in 1671: 'For 'tis notorious that there is not any sort of people so inclinable to seditious practices as the trading part of a nation ... And, if we reflect upon our late miserable distractions, 'tis easy to observe how the quarrel was chiefly hatched in the shops of tradesmen, and cherished by the zeal of prentice-boys and city gossips.'[63]

There was however internal opposition led by royalists in London to the Puritan takeover of the City.[64] On October 24, 1642 the Venetian ambassador wrote:

> In this city a by no means negligible party is disclosing itself in his [the king's] favour, and a goodly number of men, anxious to make themselves known as such by those who inwardly cherish the same laudable sentiments, have introduced the practice, following His Majesty's soldiers, of wearing a rose coloured band on their hats, as a sign that they are his faithful servants. The Mayor, on the other hand, who is a Puritan, whose duty it is to superintend the government of the City, is endeavouring by vigorous demonstrations to prevent the spread of this custom ... [65]

The conflicts sometimes led to violence and the ambassador reported on an affray which took place in St. Paul's Cathedral on the 30th October 1653:

> Last Sunday ... a riot took place in St. Paul's Cathedral to the consternation of all present. Among the various sects, of which more than fifty may now be counted in England, that of the Anabaptists which at present numbers many proselytes, had a place assigned it there for preaching purposes ... on the day in question, a considerable mob of apprentices appeared there on a sudden to oust the Anabaptists, whose preacher they began to insult, His followers took his part, but though the military were called in and quelled the tumult, some were killed and others maimed.[66]

But that London was the centre of opposition to the crown was reflected in political affiliation in the post-restoration period. In the 1661 election, it returned to parliament four MPs, two Presbyterians and two Independents.[67] Pepys records a conversation with a Mr Hill on 26th July 1661, telling him that 'the King now would be forced to favour the Presbytery, or the City would leave him.'[68] Later in 1663 Pepys claimed that the royalists were afraid of

---

[61] Hyde, *The History,* Volume 2, 1888, pp. 226, 238. Hyde was quoting from Hobbes in this account. The Corporation Act passed in 1661 which prevented non-Anglicans from holding office in towns and corporations, is further confirmation of the role of towns in supporting parliament during the civil war.
[62] R. Baxter, *Reliquiare Baxterianae*, Part 3, 1696, p. 30.
[63] C. Hill and E. Dell (eds.), *The Good Old Cause: The English Revolution of 1640-1660, Its Causes, Course and Consequences,* 1969, p. 238. After the restoration, Bishop Hacket claimed that the 'Conveticles in Corporations were the seminaries out of which the warriors against King and Church came.' Stone, *Causes*, p. 103.
[64] Porter and Marsh, *The Battle*, p. 46.
[65] Razzell, *The English Civil War, Volume 2: 1640-42*, p. 312.
[66] Razzell, *The English Civil War, Volume 4: 1648-1656*, p. 157. For other accounts of opposition to the radicalism of the sects see K. Lindley, 'London and popular freedom in the 1640s' in R.C. Richardson and G.M Ridden (eds.), *Freedom and the English Revolution*, 1986, pp. 127, 132.
[67] R.C. Thatham and W. Matthews (eds.), *The Diary of Samuel Pepys,* Volume 2, 1995, 20 March 1661, p. 57, fn.
[68] Ibid, p. 141.

London and that 'they talk of rebellion, and I perceive they make it their great maxime to be sure to Maister the City of London.'[69] As a result of the fear of the City, in 1683 Charles II suspended the rights and privileges of the corporation, which were only restored by William and Mary in 1689.

Puritanism in the Civil War

Religion played a major role in the civil war, although it was not the first issue to provoke parliament in its opposition to the crown.[70] London had been the centre of separatist Puritan congregations from the fourteenth century onwards,[71] and according to Baxter, 'The remnant of the old Separatists and Anabaptists in London was then very small and inconsiderable but they were enough to stir up the younger and inexperienced sort of religious people.'[72] Contact with London influenced opposition to the religious policies of Laud, which was most vocal 'in great clothing towns, because they see no such thing, as they say, in the churches in London.'[73] London's influence on the spread of puritanism occurred through its trading links:

> The growth of puritanism, wrote a hostile critic, was by meanes of the City of London (the nest and seminary of the seditious faction) and by reason of its universall trade throughout the kingdome, with its commodities conveying and deriving this civil contagion to all our cities and corporations, and thereby poisoning whole counties.[74]

London merchants were also responsible for endowing lectureships in their home towns, encouraging the widespread spread of puritanism.[75] Baxter concluded 'that there was [not] in all the World such a City [as London] for Piety, Sobriety and Temperance.'[76]

Perhaps the essence of puritanism was summarized by Bishop Gardiner in the 1540s: 'They [the puritans] would have all in talking, they speak so much of preaching, so as all the gates of our senses and ways to man's understanding should be shut up, saving the ear alone.'[77] This was the consequence of a 'rational' rejection of all magic and ritual, described so eloquently by Milton and central to Weber's thesis on the protestant ethic. Puritans placed great emphasis on individual conscience often linked to literacy and the reading of the bible.[78]

However, much of puritanism was a reaction to the historical threat from catholicism, and one source noted that John Milton who 'was the oracular poet of the hard-working, godly, mercantile London citizenry, who saw themselves increasingly menaced by papists at court and abroad, and for him and his family and friends, the Gunpowder Plot was both the incarnation of their worst nightmares and solid proof that they were right to be afraid.'[79]

---

[69] Pepys, Volume 4, p. 131.
[70] Baxter, *Reliquiare Baxterianae,* p. 18.
[71] M.M. Knappen, *Tudor Puritanism,* 1965, pp. 8, 290; A. Woolrych, 'Puritanism, politics and society', in E.W. Ives (ed.), *The English Revolution, 1600*-60, 1968, p. 53; B. Manning, *The English People and the English Revolution*, 1976, p. 38; H. Barbour, *The Quakers in Puritan England*, 1964, pp. 21, 22.
[72] Woolrych, 'Puritanism', p. 53.
[73] Underdown, *Revel*, p. 78.
[74] R. H. Tawney, *Religion and the Rise of Capitalism*, 1936, pp. 203, 204. See also Hyde, *The History*, Volume 2, p. 226; Hirst, *The Representative*, p. 47.
[75] J.E.C. Hill, 'Puritans in the dark corners of the land', *Transactions of the Royal Historical Society*, 5th Series, Volume 13, 1963, p. 95.
[76] Baxter, *Reliquiare Baxterianae*, Part 3, 1696, p. 17.
[77] M.M. Knappen, *Tudor Puritanism,* 1965, p. 68.
[78] Woolrych, 'Puritanism', p. 87.
[79] D. Purkiss, *The English Civil War: A People's History*, 2007 p. 305.

The Puritan reformation often created a hostile reaction among the general population, described by one apologist as the 'weeping and bewailing of the simple sort and especially of women, who going into the churches, and seeing the bare walls, and lacking their golden images, their costly copes, their pleasant organs, their sweet frankinsense, their gilded chalices, their goodly streamers, they lament in themselves and fetch deep sighs and bewail the spoiling and laying waste of the church, as they think.'[80]

By the 1620s Dorchester was in the grip of an authoritarian Puritan regime 'which regulated the most minute details of the residents' lives with fanatical rigour. Swearing, tippling, sexual irregularities, "night walking" absence from church, feasting and merry making, and general idleness: these were the common targets of reformers everywhere.'[81] The clothing industry was notorious for its puritanism and its support for parliament; for example, one contemporary noted that Colchester 'is a raged, factious Towne, and now Swarming in Sectaries. Their Trading Cloth ... '[82]

The bulk of London Puritans were made up of tradesmen and artisans:

> ... depositions of Francis Johnson's separatist congregation in London, when they were arrested in 1593, show that they included six shipwrights, five tailors, four servants, three ministers, three weavers or cloth-workers, three carpenters, three clerks, and scriveners, two fishmongers, two haberdashers, two shoemakers, two purse-makers, a glover, a cup-maker, a goldsmith, a "scholler", a broad-weaver, an apothecary, a coppersmith, and two schoolmasters. Most were men under thirty-five years old.[83]

This socio-economic group has historically been the core group supporting puritanism, as pointed out by Weber: 'With great regularity we find the most genuine adherents of puritanism among the classes which were rising from a lowly status, the small bourgeois and farmers.'[84] The low status suburbs and some of the liberties very quickly earned a reputation for puritanism and after 1640, for radicalism. In 1642, the inhabitants of the eastern suburbs of London, 'mariners, soldiers, or private persons' petitioned against the removal of their own trained bands from the Tower and the violence which had been used against Puritans.[85] Southwark was another suburb with a radical reputation: 'Here, the tanners, glovers and brewery workers were notorious for lawlessness and sedition. In May 1640 ... they joined with the sailors of Bermondsey in a great demonstration against Laud.'[86]

However, during the civil war period, puritanism appealed to a greater range of socio-economic groups:

> To contemporaries the chosen seat of the Puritan spirit seemed to be those classes in society which combined economic independence, education, and a certain decent pride in their status, revealed at once in a determination to live their own lives, without truckling to earthly superiors, and in a somewhat arrogant contempt for those who, either through weakness of character or through economic helplessness, were less resolute, less vigorous and masterful, than themselves. Such ... were some of the gentry. Such, conspicuously were the yeomen, 'mounted on a high spirit, as being slaves to none,' especially in the free-holding counties of the east. Such, above all, were the trading

[80] Ibid, pp. 435, 436.
[81] Underdown, *Revel*, p. 52.
[82] E.S. De Beer, *The Diary of John Evelyn*, Volume 3, 1955, p. 177.
[83] H. Barbour, *The Quakers in Puritan England*, 1964, pp. 21, 22.
[84] M. Weber, *The Protestant Ethic and the Spirit of Capitalism*, 1930, p. 174.
[85] Pearl, *London*, p.40.
[86] Ibid.

> classes of the towns, and of the rural districts which had been partially industrialized by the decentralization of the textile and iron industries.[87]

The leaders of the Puritan movement in parliament were members of the gentry and aristocracy – John Pym, the Earls of Warwick and Holland, Lords Saye, Lord Brooke and John Hamden – who were shareholders in the Providence Company, a trading company in the Caribbean.[88] In the early period of the civil war parliament attracted great support from the aristocracy and gentry on constitutional and economic grounds.[89]

The influence of puritanism on the support for parliament occurred not only in London, but also elsewhere such as in Lancashire, where the Oliver Heywood noted in his diary:

> Many days of prayer, have I known my father keep among God's people; yea, I remember a whole night wherein he, Dr Bradshaw, Adam Faernside, Thomas Crompton, and several more did pray all night in a parlour at Ralph Whittal's, upon occasion of King Charles demanding the five members of the House of Commons. Such a night of prayers, tears, and groans, I was never present at all in my life.[90]

The parliamentary Puritans captured both the City government and its trained bands, so giving parliament its first soldiers. This preceded the king's early departure from Whitehall in January 1642, which prevented a successful counter-revolution in London.[91] There was however resistance to the imposition of Puritan discipline, as illustrated by events in London where many riots were touched off by attempts to suppress popular amusements. There were sporadic outbreaks in London, including an apprentice riot at Christmas 1645, and another in April 1648 when troops broke up a Sunday tip-cat game in Moorfields.[92]

There were also internal divisions within the Protestant movement, which eventually led to serious political conflicts. Presbyterians began to increasingly oppose the radicalism of the Independents, the Baptists and other religious sects which dominated the New Model Army, leading to differences in support for the monarchy. By June 1651 'many English Presbyterians were beginning to opt for monarchy ... A Presbyterian minister rejoicing in the name of Love was arrested in London during May for conspiring on behalf of the king. He and another minister were executed on Tower Hill at the beginning of August as a warning to all other Presbyterians sympathetic to Charles II.'[93]

These political conflicts were partly the result of differences in socio-economic status:

> The general picture conveyed of Presbyterians in Nottinghamshire is of solid, respectable individuals drawn predominantly from the ranks of the 'middling sort'. Over half of the county's Presbyterians lived in the town of Nottingham. This very much reflects both the national and regional picture of Presbyterianism ... as a faith of the 'urban middle class' ... supporters were predominantly drawn from the upper 'middling sorts', minor or pseudo gentry and their servants. The pseudo-gentry consisted of wealthier merchants, lawyers, civil servants and the younger sons of gentry. Though not part of the landed elite, their status as gentlemen and esquires was increasingly recognized throughout the century and their greater wealth distinguished them from the 'middling sorts'.[94]

---

[87] Tawney, *Religion*, p. 208.
[88] C.V. Wedgwood, *The King's War, 1641-1647*, 2001, p. 28.
[89] Baxter, *Reliquiare Baxterianae*, pp. 30, 31.
[90] W. Haller, *The Rise of Puritanism*, 1957, pp. 297, 298.
[91] Pearl, *London*, p. 132.
[92] Underdown, *Revel,* p. 261.
[93] Ashley, *The English*, p. 173.
[94] Jennings, *The Gathering*, p. 244

The variations in social status between the Presbyterians and the more radical sects was reflected in their appearance: 'While the one party retained the close-cropped and ungainly appearance of the Independents in the days of Cromwell, our Presbyterian clergy developed into full periwigs and flowing luxuriance of band and habit which usually characterized persons of their status after the Restoration.'[95]

Of the Nottingham Presbyterians Lucy Hutchinson wrote

> the Presbyterians were more inveterately bitter against the fanatics than even the Cavaliers themselves ... and prayed seditiously in their pulpits and began openly to desire the king, not for good will to him, but only for the destruction of all the fanatics. In 1660, a confrontation occurred in Nottingham between the young men of the town who were demonstrating for the return of the King, and soldiers of Colonel Hacker's regiment ... Charles II's Declaration at Breda in 1660, which promised to allow a 'measure of religious liberty to tender consciences', encouraged many Presbyterians to actively campaign for his return.[96]

After the restoration settlement, the Puritan aristocracy and gentry abandoned religious dissent, which became dominated by the middle sort.[97] The middle classes were too influential to allow the eclipse of dissent, which eventually became embedded in English society.[98] The Compton Census of 1676 confirmed that dissenters were 'mostly found in towns with a strong puritan tradition, in centres of the cloth industry, and in places where the social and residential structures created conditions favourable to religious individualism.'[99]

Richard Baxter's Account of the Civil War

Richard Baxter, although a Puritan minister who had served in the New Model Army, was nearest to a contemporary with the most sociological understanding of the civil war. He summarized the role of religion as follows:

> ... the generality of the People through the Land (I say not *all* or every *one*) who were then called Puritans, Precisions, Religious Persons ... and speak against Swearing, Cursing, Drunkeness, Prophaness etc. I say, the main body of this sort of Men, both Preachers and People, adhered to Parliament. And on the other side, the Gentry that were not so precise and strict against an Oath, or Gaming, or Plays, or Drinking, nor troubled themselves so much about the Matter of God and the World to come, and the Ministers and People that were for the King's Book, for Dancing and Recreation on the Lord's Days ... the main Body of these were against the Parliament.[100]

Baxter elaborated on this analysis by stating that 'though it must be confessed that the public safety and liberty wrought very much with most, especially the nobility and gentry who adhered to Parliament, yet it was principally the difference about religion that filled up the Parliament's armies and put the resolution and valour into their soldiers, which carried them on in another manner than mercenary soldiers are carried on.'[101] On the other side it was the 'ignorant rabble [who] are everywhere the greatest enemies against Godly ministers and

[95] C.E. Whiting, *Studies in English Puritanism* ,1931, p. 44; Jennings, *The Gathering*, p. 244.
[96] Jennings, *The Gathering*, p. 160.
[97] H. Perkin, *The Origins of Modern English Society, 1780-1880*, 1969, pp. 34, 42.
[98] Ibid; Jennings, *The Gathering*, p. 278
[99] Underdown, *A Freeborn*, pp. 120, 121.
[100] Baxter, *Reliquiare Baxterianae* , pp. 30, 31.
[101] Quoted in Woolrych, 'Puritanism', pp. 93, 94.

people ... the Tinkers and Sowgaters and water carriers and beggars and bargemen and all the rabble that cannot reade, nor even use, the bible.'[102]

He described the puritanism of artisans, particularly weavers, who were literate and read the bible and other religious works, and how the occupational structure of Kidderminster aided his evangelism.

> A weaver or a Shoemaker or a Taylor can worke without the wetting or tiring his body, and can thinke and talke of the concerns of his soule without impediment to his labour. I have known many [at Kidderminster] that weave in the Long Loome that can set their sermon notes or a good book before them and read and discourse together for mutual edification while they worke. But the poor husbandman can seldom do ... Another help to my Success was, that my People were not *Rich:* There were among them very few *Beggars*, because their common Trade of Stuff-weaving would find work for all, Men, Women and Children, that were able ... The Magistrates of the Town were few of them worth 40 £ *per* An. ...The generality of the Master Workmen, lived but a little better than their Journey-men, (from hand to mouth) ... [103]

Baxter further elaborated the influence of socio-economic status on religious and political affiliation.

> And, which I speak with griefe, except here and there one (of the richer sort mostly that are not pincht with the necessity of others) there is more ignorance of religion among them than among tradesmen and corporation inhabitants and poore men of manuall artificers. And yet they are not usually guilty of the sins of Gluttony, fornication or adultery, so much as rich citizens and great men's full and idle serving men ... But among merchants, mercers, drapers and other corporation tradesmen, and among weavers, taylors, and such like labourers, yea among poore naylors, and such like, there is usually found more knowledge & religion than among the poor enslaved husbandman. I may well say *enslaved*: for more are so servilely dependent (save household servants and ambitious expectants) as they are on their landlords. They dare not displease them lest they turn them out of their houses; or increase their rents. I believe the Great Landlords have more command of them than the King hath. If a Landlord be but malignant, and enemy to piety or sobriety or peace, his enslaved tenants are at his beck to serve him, in matters of any publike consequence.[104]

He wrote approvingly in 1673 of the presence 'in most places' of 'a sober sort of men of the middle rank, that ... are more equal to religion than the highest or lowest usually are ...'[105] Another Puritan, Nehemiah Wallington, in 1650 anticipated Wesley in his argument about the link between wealth and religious sobriety. He lamented that the 'great change in some men, for ... when they in mean condition, they were humble, and they were for God, but now they be rich ... [they have purchased] brave houses, fine apparel, or belly cheer, when the poor saints have perished in want.'[106]

The authority of a landowner over his employees continued to exist well into the nineteenth century and was illustrated by an account in a local Hertfordshire autobiography as follows:

> Every worshipper had to wait outside [the church] until the squire had walked to the widening of the path and had made that dramatic flourish when he pulled out his gold watch and looked up at the church clock. When he was satisfied that the clock had not dared to contradict the time on his watch

[102] R. Baxter, *The Poor Husbandman's Advocate to Rich Racking Landlords*, 1926, p. 24.
[103] Ibid, p. 26; Baxter, *Reliquiare Baxterianae*, p. 94.
[104] Baxter, *The Poor Husbandman's*, p. 27.
[105] J. Barry and C. Brooks (eds.), *The Middling Sort of People: Culture, Society and Politics in England, 1550-1800*, 1994, p. 48.
[106] Seaver, *Wallington's World*, p. 129.

> he would nod to the clock, smile at the admiring people, and hold out his hand to the vicar standing in the doorway to welcome him. Then the bells would ring merrily and then the other direction the staff of another big house marched to the church: the housekeeper and butler in front, two footmen next then about fourteen girls walking in pairs. They were paraded to church every Sunday, but were only allowed one free evening a month.[107]

By this period deference no longer had such a powerful hold as it did in the seventeenth century:

> We paid three pounds an acre for our land [in Hertfordshire], and looked over fences at land held by big farmers for seventeen and sixpence an acre ... My father once asked a gentlemen farmer to rent him a piece of ground ... He was given a definite refusal: 'Certainly not' ... Some months later the same gentleman stopped my father and said, 'I suppose you have heard that I am standing at the next election. We've been neighbours for some years. Can I could on your vote?' It was not my father's way to avoid the truth. 'Certainly not', he replied; 'my vote is the most valuable thing I have got ...' [108]

The Role of the Navy

Protestantism became embedded in the navy, partly as a result of the historical reaction against the threat from Catholic powers, particularly from Spain. This often took the form of Puritan worship:

> When Drake set sail from Plymouth on November 15, 1577, on the voyage that was to take him around the world, he carried for the instruction of his men Bibles, prayer books, and Foxe's Book of Martyrs, and had, for chaplain, one Francis Fletcher ... Routine religious duties were as rigorously enforced as any other discipline of the ship, and in times of crisis the commander prescribed special religious exercises.[109]

This emphasis on worship also applied to private navies such as those of the East India Company. The Company 'saw to it that ships were amply provided with edifying reading matter. The essentials were a Bible and a Book of Common Prayer, John Foxe's *Book of Martyrs*'[110] and on 'the rare occasions when a ship's commander failed in his religious responsibilities, he was subject of complaints, not only from the chaplains but from the seamen themselves.'[111] The religious radicalism of mariners was sometimes found outside London. For example 'a gang of seamen battered down the images and glass of Rochester Cathedral, and destroyed the cherished library accumulated by the poet Dean Henry King.'[112]

This radicalism led to the participation of ordinary seamen in religious and political protests against the crown's attempt to suppress parliament:

> When ... the Five Members returned to Westminster, some 2,000 sailors accompanied them, and their participation was explained in the anonymous *The Seamans Protestation Concerning their Ebbing and Flowing to ... Westminster.* The pamphlet maintained that the sailors had not been summoned but came 'of our own free voluntarie disposition ... as well to protect *White-hall* ... ' This

[107] B. L. Coombes, *These Poor Hands: The Autobiography of a Miner Working in South Wales,* 2012. [First published in 1939], pp. 5, 6.
[108] Ibid, p. 4.
[109] L.B. Wright, *Religion and Empire: The Alliance between Piety and Commerce in English Expansion, 1558-1625*, 1943, p. 1.
[110] Ibid, p. 71.
[111] Ibid, p. 68.
[112] Wedgwood, *The King's War*, p. 124.

publication too, blamed "Papists" as the enemy, and concluded with an oath supposedly sworn by the mariners, closely modelled on Parliament's Protestation oath.[113]

Had the king held the fleet, it would have created major problems for parliament. He would have been able to blockade the Thames, starving London of trade, food and fuel. Such an outcome would probably have led to a major loss of support for parliament, changing the course of the civil war.[114] Mariners lived in communities on both sides of the Thames, along the shipyards in Wapping, Shadwell, Limehouse, Rotherhithe and Southwark. [115] St Dunstans's Stepney, was one of the most staunchly Protestant in London. This was partly because its congregation included a high proportion of Huguenot refugees.[116]

These areas also contained the artisans and tradesmen living in the suburbs, and they formed with the mariners the crowds who had lobbied and petitioned parliament for radical political and religious reform. [117] Much of the political and religious divide which shaped the civil war was based on communities which cut across individual differences of support, providing socially structured action groups.

Parliament's control of the navy was brought about by the Earl of Warwick who seized it in 1642, with only two captains refusing to surrender their ships.[118] The gentlemen commanders who had dominated the navy before the civil war were replaced by men who had been active in popular radical politics. [119] According to Bernard Capp only 20 of the 319 officers appointed by the Commonwealth and Protectorate, came from the gentry, mostly from younger branches which had gone into trade.[120]

Parliament used the navy to land forces and blockade ports held by the royalists, which played an important role in winning the civil war.[121] The navy also ensured that weapons could be imported from abroad – by 4 October 1642 these included 5,580 pikes, 2,690 muskets, 980 pairs of pistols, 246 carbines and 3,788 sets of armour.[122] Warwick's sailors – approximately 3,000 strong – were also organized into two regiments and played an important part in parliament's victory.[123] However, after the polarisation of the opposition into Presbyterian and Independent factions in 1648, there was a significant defection of ships and mariners from the parliamentary cause.[124]

Socio-Economic Status and the Civil War.

An analysis of the socio-economic status of participants in the civil war is fraught with difficulty. Information on the elites is relatively easy to obtain, but data on rank-and-file members of political and religious groups is largely lacking.[125] Although statistical analysis is virtually impossible, literary evidence is abundant but often very partisan given the nature of

[113] R.J. Blakemore and E. Murphy, *The British Civil Wars at Sea, 1638-1653*, 2018, p. 47.
[114] M.J. Lea-O'Mahoney, *The Navy in the English Civil War* (D.Phil. University of Exeter, 2011), p. 8.
[115] Wedgewood, *The King's Peace*, p. 29.
[116] Purkiss, *The English*, pp. 41, 42.
[117] C.V. Wedgewood, *The King's War, 1641-1647*, 1983, p. 61; Purkiss, *The English*, p. 470.
[118] Wedgewood, *The King's War,* p. 105.
[119] Blakemore and Murphy, *The British*, p. 182.
[120] R. Hutton, *The British Republic 1649-1660*, 2000, p. 12.
[121] Blakemore and Murphy, *The British*, p. 74.
[122] Porter and March, *The Battle*, p. 41.
[123] Ibid, p. 80.
[124] Blakemore and Murphy, *The British*, p. 137; Lea-O'Mahoney, *The Navy*, p.199.
[125] Underdown, *Revel*, pp. viii, 183-184; C. Holmes, *The Eastern Association in the English Civil War*, 1974, p. 172.

the civil war. However, by adopting the principle of triangulation which uses sources from both sides of the conflict, it is possible to achieve a degree of consensus.

There is also the difficulty of significant changes in the adherents to parliament and the crown, so that for example more than two-fifths of the Commons and the majority of the Lords left Westminster for the king's cause in 1642.[126] Also there were major changes in the social structure of England during the sixteenth and seventeenth centuries which affected the social composition of supporters of the crown and parliament:

> ... between 1540 and 1640 ... The number of peers rose from 60 to 160; baronets and knights from 500 to 1400; esquires from perhaps 800 to 3,000; and armigerous gentry from perhaps 5,000 to 15,000 ... This numerical expansion was made possible mainly by the transfer of huge quantities of landed property first from the church to the crown and then from the crown to the laity, mostly gentry, in a series of massive sales to pay for foreign wars.[127]

The House of Commons itself changed during this period, so that it grew from approximately 300 members to about 500, and the gentry component in it rose from about 50 per cent to approximately 75 per cent.[128] Throughout the civil war there were major changes in the numbers of adherents to the parliamentarian and royalist armies, making it difficult to carry our statistical analysis of membership numbers. The alignment of forces of 1640 was different from that of 1642, by which time a large number of former parliamentarians had moved over to royalism. There were changes again in 1648, when conservative elements among parliamentarians, designated as Presbyterians, switched back into support for the king.[129] Many of those who had supported parliament on constitutional grounds in 1640, like Sir Edward Hyde, transferred their allegiance in 1642, whereas those who supported parliament on religious grounds tended to continue to support the parliamentary cause.[130]

The most significant change in parliament occurred in December 1648 when 'under the command of Colonel Thomas Pride, the army purged the House of Commons of any opposition (some 100 MPs were excluded 45 who were actually arrested – others prudently removed themselves). It was the remaining "Rump" of around 70 MPs who would address the matter of bringing the King to trial.'[131]

There were also major changes in demographic and economic conditions during the second half of the sixteenth and first half of the seventeenth centuries. Population grew by over 30 per cent in the period 1570-1609 and prices more than doubled between 1550 and 1600.[132] Lawrence Stone noted the changes that had taken place in English society during the sixteenth century as a result of population growth: 'the excess supply of labour relative to demand not only increased unemployment, but forced down real wages to an alarming degree ... [there was] a polarisation of society into rich and poor: the upper classes became relatively more numerous and their real incomes rose; the poor also became more numerous and their real incomes fell.'[133]

---

[126] R Richardson, *The Debate On The English Revolution*, 1998, p. 45.
[127] Stone, *Causes*, pp. 72, 73.
[128] Ibid, p. 92.
[129] Ibid, p. 34.
[130] Ibid, p., 143.
[131] D. Flintham, *Civil War London*. 2017, p. 41.
[132] E.A. Wrigley and R.S. Schofield, *The Population History of England & Wales*, 1981; B.R. Mitchell and P. Deane, *Abstracts of British Historical Statistics*, 1971, pp. 484-486; J. Thirsk, 'The farming regions', pp. 857, 858, 1861; E.H. Phelps-Brown and S.V. Hopkins**,** 'Seven centuries of the prices of consumables compared with builders' wage rates' in E.M. Carus-Wilson (ed.), *Essays in Economic History,* Volume 2, 1962, pp. 193-195.
[133] L. Stone, 'Social mobility in England, 1500-1700', *Past and Present*, Volume 33, 1966, pp. 26-29, 49.

Recent research by Alexandra Shepard using church court depositions indicates that wealth inequality increased markedly during the first half of the seventeenth century.

Table 4: Median Wealth in England, Deflated to 1550-1559 Values, by Social Group Over Time.[134]

	1550-74	1575-99	1600-24	1625-49
Gentry (N = 367)	£16.00	£8.00	£59.30	£50.00
Yeomen (N = 1104)	£5.34	£7.27	£23.92	£50.00
Craft/Trade (N = 2185)	£2.40	£1.40	£2.99	£5.00
Husbandmen (N = 2127)	£4.00	£3.37	£5.93	£5.00
Labourers (N = 273)	£1.58	£1.35	£1.36	£1.03

Although the gentry increased their wealth – increasing by about three times – the yeomen's wealth had grown nearly ten times, while labourers' worth decreased slightly. There was little change among husbandmen and a doubling of wealth among craft/tradesmen. This data suggests that this was a period of 'the rise of the yeomanry' during the first half of the seventeenth century. Wrightson has summarized the situation of the yeomen as follows:

> Like the gentry, they benefited from low labour costs as employers, while as large-scale producers they stood to gain from rising prices ... Again like the gentry, they took a thoroughly rational and calculating attitude towards profit ... often ambitious, aggressive, [and] small capitalists ... [they experienced] gradually rising living standards, the rebuilding of farmhouses and their stocking with goods of increasing sophistication and comfort.[135]

These changes had a significant effect on the relationships between different social classes. Village elites composed of local gentry and prosperous yeomen farmers and tradesmen began to attempt to control the impoverished and unruly elements of the poor.[136]

> Long before the civil war, especially in towns and pasture regions where cloth-working or other industrial pursuits were available, the growing gulf between the people 'of credit and reputation' and their less prosperous neighbours was reflected in the emergence of parish elites who saw it as their duty to discipline the poor into godliness and industriousness, and who found in puritan teaching (broadly defined) their guide and inspiration. Along with reformist elements of the gentry and clergy, they mounted a campaign against the traditional culture of the lower orders.[137]

The merging of interests between the gentry and prosperous yeomen and tradesmen makes it difficult to distinguish social statuses in this period.[138] One-hundred-and-two Yorkshiremen obtained coats of arms as gentlemen between 1558 and 1642 and roughly half of them were yeomen farmers. In Lancashire two-hundred-and-two families entered the gentry: ...'the majority were prosperous yeomen.'[139] Gordon Batho has concluded that 'there was no sharp distinction between lesser gentry and the richer yeomen ... In innumerable wills and legal

[134] Data from *Perceptions of Worth and Social Status in Early Modern England* , ESRC Reference Number RES-000-23-1111.
[135] Wrightson, *English Society*, pp. 134, 135.
[136] Manning, *The English People*, p. 46; K. Wrightson, *English Society*, pp. 168-73, 181.
[137] Underdown, *Revel*, pp. 275, 276.
[138] Hirst, *The Representative,* p. 4; see also O'Day, 'Universities', p. fn 19, p. 100; Wedgewood, *The King's War*, p. 205.
[139] Manning, *1649: The Crisis*, p. 58.

documents of the age a man is described in one place as a yeomen and in another as a gentleman ... '[140]

Oliver Cromwell himself illustrates the ambiguity of status in this period. John Morrill has summarized the evidence as follows:

> ... his standing in St Ives was essentially that of a yeoman, a working farmer. He had moved down from the gentry to the 'middling sort' ... Despite his connections with ancient riches, Cromwell's economic status was much closer to that of the 'middling sort' than that to the country gentry and governors. He always lived in towns, not in a country manor house; and he worked for his living. He held no important local offices and had no tenants or others dependent upon him beyond a few household servants. When he pleaded for the selection of 'russet-coated captains who know what they are fighting for', and when he described his troopers as 'honest men, such as feared God', this was not the condescension of a radical member of the elite, but the pleas of a man on the margins of the gentry on behalf of those with whom he had had social discourse and daily communion for twenty years.

A further example of the blurring of statuses is to be found in Shakespeare's social circle in Stratford:

> The Quiney family was one of the most respectable in the town; they bore arms, had been long settled in the community, and were influential members of the corporation. They were well-educated – Richard conducted much of his correspondence with Abraham Sturley, who had been educated at Queen's College, Cambridge, in Latin – and appears from the language of this correspondence, to have been strongly puritan. Nevertheless, along with all other leading townsmen, they frequently engaged in illegal speculative activity, particularly in corn and malt.[141]

Shakespeare's own family illustrates the ambiguities in status at the end of the sixteenth century. His father John, officially a glover, had illegally traded in wool, corn and money-lending, and had yet been granted a coat of arms in 1596, warranting the title and status of 'gentleman', in spite of an earlier bankruptcy.[142] Not only did local tradesmen engage in the hoarding of grain during a period of scarcity, but all four local landed magistrates had arrangements with the townsmen to illegally store large stocks of grain on their behalf.[143] In 1601 the poor of Stratford were 'in number seven hundred and odd, young and old – something like forty per cent of the total population.'[144] As a result, the hoarding of grain resulted in threatened violence and riot by the poor, but they unwittingly appealed to the magistrates without realising that they were some of the leading forestallers of grain.[145]

The conflicting and contradictory position of the townsmen and local gentry, many of whom were of the Puritan persuasion, left them exposed to the charge of hypocrisy. When a dispute over the appointment of the Puritan minister, Thomas Wilson, broke out in 1621, his supporters were satirized in the following verse: 'Stratford is a Town that doth make a great show. But yet is governed but by a few. O Jesus Christ of heaven I think that they are but seven Puritans without doubt? For you may know them. They are so stout. They say 'tis no sin, their neighbour's house to take. But such laws their father the devil did make ... One of the Chiefest hath read far in Perkin's works. The rest are deep dissembling hypocrites.'[146]

---

[140] Ibid.
[141] P. Razzell, *William Shakespeare: The Anatomy of an Enigma*, 1990, p. 26.
[142] Ibid, p. 28.
[143] Ibid, p. 142.
.[144] Ibid, p. 140
[145] Ibid, pp. 141, 142.
[146] Ibid.

There was a great deal of social mobility at this time, with many wealthy yeomen and tradesmen achieving gentry status during the first half of the seventeenth century.[147] Gentlemen and yeomen/tradesmen were educated together in local grammar schools and universities, and so shared similar cultural backgrounds.[148] There was also an increase in the literacy of both the gentry and the middle classes, whereas most husbandmen and labourers remained illiterate during this period.[149] Because of the fear of literacy amongst the 'lower sort', as early as 1543 parliament had stipulated that 'no women, nor artificers, prentices, journeymen, servingmen of the degrees of yeomen or under, husbandmen nor labourers shall read the Bible or New Testament in English to himself or any other, privately or openly.'[150] Hobbes had complained that 'after the Bible was translated into English, every man, nay every boy and wench, that could read English thought they spoke with God Almighty and understood what He said.'[151]

The fear that established authority had of the 'lower sort' obtaining literacy was probably well-founded. As early as the fourteenth and fifteenth centuries 'throughout southern and central England groups of Lollards met secretly in towns and villages to read or listen to readings of Scripture and to consider their contemporary application. Most of them came from the class of skilled, literate traders and craftsmen. They were masons, carpenters, wool-merchants and leatherworkers – men and women whose work took them long distances in search of employment and markets.'[152]

This was as we have seen the classic socio-economic group associated with puritanism, but nevertheless there were many adherents of a higher status. When Prynne, Burton and Bastwick, martyrs to the Protestant cause who had been punished and exiled by the king, returned to London on the 28th November 1640, 'some three thousand coaches, and four thousand horsemen' were included in the crowd that welcomed them back to London.[153] During the building of the defensive wall around London, the people helping to build the wall included 'a great company of the common council and diverse other chief men of the city'.[154]

Nevertheless the evidence suggests that wealthy aldermen largely supported the crown: 'strong financial ties bound the wealthy citizens to the crown ... the court contented itself with the belief that the disturbances involved the meaner sort of people and that the affections of the better and main part of the city favoured the king.' [155] As a result of this belief, the king placed a guard to the approaches of the Commons with soldiers 'who disliked or despised the Londoners and officers who, being Westminster men, were friends and dependents of the Court.'[156]

Clarendon summarized his conclusions about the link between status and affiliation to crown or parliament:

---

[147] Wrightson, *English Society*, p.27; see also Manning, *1649 The Crisis*, p. 51.
[148] R. O' Day, 'Universities and professions in the early modern period', *oro.open.ac.uk*, pp. 83, 87, 101; Wrightson, *English Society,* pp. 89; 186, 191-193; Stone, *Causes*, pp. 74;
[149] Wrightson, *English Society,* p. 191.
[150] D. Wilson, *The People and the Book: The Revolutionary Impact of the English Bible 1380-1611*, 1976, p. 87.
[151] Stone, *Causes*, p.101.
[152] Wilson, *The People*, p. 26.
[153] Purkiss, *The English*, p. 99.
[154] Ibid, p. 286.
[155] S. Porter and S. Marsh, *The Battle for London*, 2010, p. 9; see also D. Hirst, *The Representative of the People? Voting in England under the Early Stuarts*, 1975, p. 138; R. Ashton, *The City and the Court, 1603-1643*, 1979, p. 206; Pearl, *London*, p. xi.
[156] Wedgwood, *The King's War*, p. 32.

> ...though the people in general [favoured the king], (except in great towns and corporations, where, besides the natural malignity, the factious lecturers, and emissaries from the parliament, had poisoned the affections,) and especially those of quality, were loyally inclined ... [157]

Most contemporaries believed that the main support for parliament came from London and other corporate towns, with a strong support from the middle sort.[158]

Lilly writing in 1651 described how the terms Cavalier and Roundhead originated:

> They [the Puritans] had their hair of their heads very few of them longer than their ears, whereupon it came to pass that those who usually with their cries attended at Westminster were by a nickname called *Roundheads*, and all that took part or appeared for his Majesty, *Cavaliers* ... However the present hatred of the citizens was such unto gentlemen, especially courtiers, that few durst come into the city; or if they did they were sure to receive affronts and be abused.[159]

Pepys in his diary frequently distinguished between citizens and gentlemen living in London; for example at the end of December 1662 he wrote 'only not so well pleased with the company at the house today, which was full of Citizens, there hardly being a gentleman or woman in the house ... [160]

Baxter concluded that 'though it must be confessed that the public safety and liberty wrought very much with most, especially the nobility and gentry who adhered to Parliament, yet it was principally the difference about religion that filled up the Parliament's armies and put the resolution and valour into their soldiers, which carried them on in another manner than mercenary soldiers are carried on.'[161] There is evidence however of tensions between the aristocracy and gentry on the one hand and the middle classes during the outbreak of the civil war. The burden of ship money fell disproportionately on yeomanry and tradesmen, something which was highlighted by William Prynne in his attacks on the crown.[162] These tensions were exacerbated by the attitudes of the aristocracy and gentry towards the new middle classes.

> The pretensions of yeomen to quality with gentry caused resentment amongst some gentlemen. 'The yeomanry' wrote Edward Chamberlayne ...'grow rich, and thereby so proud, insolent, and carless, that they neither give that humble respect and awful reverence which in other Kingdoms is usually given to nobility, gentry, and clergy' ... which has 'rendered them so distasteful ... even to their own gentry' that the latter sometimes wished that the yeomen's activities were less profitable or they were taxed more heavily.[163]

This is consistent with the patterns of wealth depicted in Shepard's analysis of church court depositions, whereby the yeomanry achieved parity with the gentry by the middle of the seventeenth century.

---

[157] Hyde, *The History*, Volume 2, p. 226.
[158] An indication of where the city's sympathies lay was the return of four members opposed to the court in the election to the Long Parliament in October 1640.
[159] W. Lilly *The True History of King James I and Charles* I, 1715, pp. 55-56 – first published in 1651, p. 246. The association between puritanism and short hair was also found in New England where the rule was 'that none should wear their hair below their ears'. T. Hutchinson, *The History of the Colony and Province of Massachusetts* , Vol.1, 1936, pp. 130, 131. Some Baptists continued to prohibit long hair as late as 1689. See A.C. Underwood, *A History of the English Baptists,* 1947, p. 130.
[160] R. Latham and W. Matthews (eds.), *The Diary of Samuel Pepys*, Volume 3, 1995, p. 295.
[161] Baxter, *Reliquiare Baxterianae*, pp. 30, 31.
[162] See Manning, *The English People*, pp. 10, 231.
[163] E. Chamberlayne, *Anglia Notitia*, 1672, pp. 61-63.

A number of scholars have noted the breaking of the alliance between the gentry and the middle classes, as the demands for political and religious reforms began to emerge.[164] However, this reflected some long-term tensions between these socio-economic groups. For example, as early as 1576, a clause was inserted in an Act of Parliament prohibiting West Country clothiers from buying more than 20 acres of land.[165]

In Somerset it was alleged that

> ... a great part of the estate of every farmer or substantial yeoman should be taken from them; alleging that some lords had said that £20 by the year was enough for any peasant to live by ... persuading the substantial yeomen and freeholders that at least two parts of their states would by that commission taken from them ... For though the gentlemen of ancient families estates in that county were for the most part well affected to the King ... yet there were people of inferior degree, who, by good husbandry, clothing, and other thriving arts, had gotten very great fortunes, and, by degrees getting themselves into the gentlemen's estates, were angry that they found not themselves in the same esteem and reputation with those whose estates they had ... These from the beginning were fast friends to the Parliament, and many of them were now entrusted by them as deputy-lieutenants in their new ordinance of the militia ... [166]

Likewise in Yorkshire when the king summoned the gentry of the county to York in May 1642, he omitted to summon the freeholders, who responded by claiming 'ourselves equally interested in the common good of the county', and as a result 'did take boldness to come in person to York ... thereupon the doors of the meeting house were shut, we utterly excluded ...'[167] Elsewhere 'Lord Paulet in opposition to the Militia at a combustion in *Wells* ... declared that it was not fit for any Yeomen to have allowed more than the poor Moitie of ten pounds a year ... when the power should be totally on their [the royalists'] side, they shall be compelled to live at that low allowance ... the people did not take the speech as onely directed to the Yeomen, but to all men under the degree of a Gentleman ... the Tradesmen and Merchants ....'[168]

One Parliamentarian tract published in 1643 claimed

> that this was proof that the royalists intended 'a government at discretion' after the French fashion, because 'the middle sort of people of England, and yeomanry' were the chief obstacles to such a change, and as they composed the main part of the militia, 'then by policy, or even plain force' they must be disarmed ...[169]

This can be seen indirectly as a consequence of 'the rise of the yeomanry', creating increasing demands by yeomen for equal status with their aristocratic and gentry neighbours. This resulted in tension between these groups, leading on occasions to violence. For example, 'the cavaliers in Somersetshire have used violence on the yeomanry, and have turned them out of doors, and take their arms from them, the people seeing it could not suffer it, for if they prevail now they think they shall be slaves forever.'[170]

Fear was a leading component of the civil war. As we have seen, in London the king and many Members of Parliament and the House of Lords had left London in early 1642 as a result of the fear of the population threatening them with violence and intimidation. Many of

---

[164] Manning, *The English People*, p. 46
[165] L. Stone, *The Crisis of the* Aristocracy, 1965, p. 28.
[166] Hyde, *History,* Volume 2, p, 296.
[167] Hill and Dell, *The Good Old*, pp. 244, 245.
[168] *A Memento for Yeomen, Merchants, Citizens and All the Commons in England* (August 23, 1642, B.M. E 113 (13), pp. 4, 5.
[169] Manning, *Aristocrats,*. p. 69.
[170] Manning, *The English People*, p. 328.

these members had originally supported parliament on constitutional grounds, but fear had driven them into the support of the king. Many Protestants feared Catholics, particularly after Spain's attempt to invade England during the late sixteenth century. In the provinces many of the aristocracy and gentry feared the threats from the poor and the increasing radicalism of the middle classes. And at a later stage of the war, the Presbyterians feared the increasing power of the radicals in the New Model Army.

A similar process occurred in France in the eighteenth century when the middle classes were not allowed to access higher social statuses, which according to Eleanor Barber was one of the factors behind the French Revolution.[171] There is ample evidence that the middle classes played a significant role in political developments in the English civil war, although the claim that the middle sort were the main supporters of parliament has been contested by a number of historians.[172] There is plenty of contemporary literary evidence to indicate that the middle classes played an important role in the support of parliament. Keith Wrightson has summarized this evidence**:**

> London demonstrators against episcopacy in 1641 were characterized as being 'men of mean or a middle quality', as distinct from both 'aldermen, merchants or common councilmen' on the one hand, and the 'vulgar' on the other. In Worcester 'the middle sort of people' supported the parliamentarian cause. 'The middle and inferior sort of people' of Birmingham resisted Prince Rupert's advance in 1643 despite the defeatist fears of the 'better sort'. At Bristol 'the King's cause and party were favoured by two extremes in that city; the one the wealthy and powerful men, the other of the basest and lowest sort, but disgusted by the middle rank, the true and best citizens'. Such activism and the terms in which it was described were not confined to urban centres. In Somerset the royalists were said to consist of most of the gentry and their tenants, while parliament had the support of 'yeomen, farmers, petty freeholders, and such as use manufacturers that enrich the country', under the leadership of some gentlemen and others of lesser degree, who 'by good husbandry, clothing and other thriving arts, had gotten very great fortunes' In Gloucestershire the king was supported by both the rich and 'the needy multitude' who depended upon them. Parliament allegedly had the hearts of 'the yeomen, farmers, clothiers, and the whole middle rank of the people'. According to Lucy Hutchinson, 'most of the gentry' of Nottinghamshire 'were disaffected to the parliament', but 'most of the middle sort, the able substantial freeholders , and the other commons, who had not their dependence upon the malignant nobility and gentry, adhered to the parliament'. Again, Richard Baxter saw the king as finding support among most lords, knights and gentlemen of England, together with their tenants and 'most of the poorest people', while parliament had a minority of the gentry 'and the greatest part of the tradesmen and freeholders and the middle sort of men, especially in those corporations and countries which depend on clothing and such manufactures'.[173]

The critique of the thesis that the 'middle sort' were the chief supporters of parliament, has not allowed for the major support for parliament of the middle classes in London, who were the prime movers at the beginning of the civil war and were the mainstay of the New Model Army who shaped its outcome.

The turning point in the support of London for parliament occurred in elections held on December 21 1641 to the Common Council brought in men with active parliamentary

---

[171] E. Barber, *The Bourgeoisie in 18th Century France*, 1957, p. 142.

[172] The main proponent of the middle sort hypothesis is Manning in his *The English People*. The critics of this thesis have pointed out that many of the middle classes supported royalism or remained neutral. See J. Barry and C, Brooks (eds.), *The Middling Sort of People: Culture, Society and Politics in England, 1550-1800*, 1994, p. 22; Morrill (ed.), *Reactions*, p. 71.

[173] K. Wrightson, 'Sorts of people in Tudor and Stuart England' in Barry and Brooks, *The Middling Sort*, p. 46.

Puritan sympathies. These elections transformed the politics of London, and Clarendon attributed to them the king's departure from Whitehall early in January 1642.[174]

The take-over by radical elements of the Common Council in December 1641, 'when that body was effectively captured by the radical party ... Now (wrote one later royalist sympathizer) outgoe all the grave, discreet, well-affected Citizens ... and in their Stead are chosen *Fowke* the Traytor, *Ryley* the Squeeking bodyes-maker, *Perkins* the Taylor, *Norminton* the Cutler, young beardless *Coulson* the Dyer, *Gill* the Wine-Cooper, and *Jupe* the Laten-man in *Crooked-Lane, Beadle* of the Ward ...'[175]

This was a time of revolutionary fervour:

> when Alderman *Pennington* and Captain *Venne* brought down their Myrmidons to assault and terrrifie the Members of both Houses, whose faces or opinion they liked not ... when these rude multitudes published the names of Members of both Houses, as enemies of the Commonwealth, who would not agree to their frantic propositions; when the names of those were given by Members of the House, that they might be proscribed, and torn in pieces by those Multitudes, when many were driven away for fear of their lives from being present at those consultations?[176]

This resulted in 236 MPs leaving parliament in June 1642, mostly to join the King at York.[177] Class hostility grew during the civil war, often associated with religious radicalism: Positions in local and other authorities were increasingly held by wealthy members of the middle classes. The nobility and gentry who had supported parliament against the king found that they were neglected, and people of lower status were preferred for places of authority. Clarendon noted that

> The nobility and gentry who had advance the credit and reputation of the Parliament by concurring with it against the King found themselves totally neglected, and the most inferior people preferred at all places of trust and profit.... most of those persons of condition, who ... had been seduced to do them [parliament] service throughout the kingdom, decline to appear longer in so detestable employment; and now a more inferior sort of the common people succeeded in those employments, who thereby exercised so great an insolence over those were in quality above them, and who always had a power over them, that was very grievous ... all distinction of quality being renounced. And they who were not above the condition of ordinary inferior constables six or seven years before, were now the justices of peace, sequestrators, and commissioners; who executed the commands of Parliament in all the counties of the kingdom with such rigour and tyranny as was natural for such persons to use over and towards those upon whom they had formerly looked at such a distance.[178]

Lucy the wife of Thomas Hutchinson tells 'how her husband, the parliamentary officer, found that his allies in Nottinghamshire distrusted civility, thinking it scarce possible for anyone to continue to be both a gentleman and a supporter of the godly interest.'[179]

In 1646 the Presbyterian Thomas Edwards declared that in the previous two years, and especially since parliament's victory at Naseby, the sectaries had in the most insolent and unheard-of manner abused 'all sorts and ranks of men even to the highest.'[180] Clarenden complained that the sects had 'discountenanced all forms of reverence and respect, as relics and marks of superstition.' In 1663 the Lord Mayor of London issued an order forbidding and repetition of the 'rudeness, affronts, and insolent behaviour' displayed by 'the unruly and

[174] Pearl, *London*, p. 132.
[175] Ashton, *The City*, pp. 205, 206.
[176] Ibid, p. 215. See also Stone, *Causes*, p.145.
[177] Stone, *Causes*, p.141.
[178] Hyde, *The History*, Volume 4, pp. 287, 315.
[179] L. Hutchinson, *Memoirs of the Life of Colonel* Hutchinson, 1972, p. 132.
[180] Manning, *1649: The Crisis*, p. 321.

meaner sort of people' during the Interregnum towards noblemen, gentlemen and persons of quality passing in their coaches or walking through the streets of the City. This 'undutifulness and contempt of their superiors', he claimed, had been encouraged by the 'late usurped powers.' In fact, similar orders had been issued in 1621, for hostility to strangers and jeering at the coaches of the aristocracy, and were endemic in pre-civil war London.[181]

However, the civil war increased this hostility:

> ... the fury and license of the common people, who were in all places grown to that barbarity and rage against the nobility and gentry, (under the style of *cavaliers*,) that it was not safe for any to live at their houses who were taken notice of as no votaries to the Parliament.[182]

The City authorities complained to the king that most of the disorders came not from them but 'from the unregulated and disorderly suburbs', located in 'the skirts of the city where the Lord Mayor and magistrates of London have neither power ... [and which were] fuller of the meaner sort of people.'[183] The reaction by wealthy merchants in London after 1643 accounted for the development of political presbyterianism in the City.[184] Presbyterianism attracted both aristocrats and the gentry not only in London but elsewhere in the country, and contemporaries saw the Independents, Baptists and Quakers as the main source of the extreme and radical opposition to the crown.[185] The Quakers turned out to be the most radical of the sects, including a refusal to pay tithes or to doth hats to superiors and recognize titles, which appeared extremely threatening to established authority.[186] They also criticised the aristocracy and gentry, claiming that the latter owed their position to the 'Norman Yoke', seizing land and property by forceful dispossession. [187]

Although the Quakers had relatively humble origins – many of them had come from a Baptist background[188] – they were very literate and established their own libraries with printed books and tracts.[189] Although they eventually espoused pacifism, during the civil war period they were active in the parliamentary army.[190] All Puritan denominations appear to have had high levels of literacy, particularly the Presbyterians, many of whose ministers had university degrees.[191]

Socio-Economic Status and the Royalist and New Model Armies.

There is a difficulty in analyzing the social status of the parliamentary army during the civil war because of its changing composition and numbers. In March 1649, the Commonwealth had in England 44,373 soldiers; in July 1652 it had nearly 70,000, whereas in February 1660, its numbers were fixed at 28,342.[192] This is less of a difficulty with the royalist army as it was in existence for only a relatively short period.

---

[181] K. Thomas, *In Pursuit of Civility: Manners and Civilization in Early Modern England*, 2018, p. 322.
[182] Ibid, p. 318. See also Hill and Dell, *The Good Old*, p. 246.
[183] Pearl, *London*, p. 129.
[184] Ibid, p.204.
[185] Jennings, *The Gathering*, pp. 174, 175, 187; George Yule, *The Independents in the English Civil War*, 1958, p. 57.
[186] Jennings, *The Gathering*, p, 187.
[187] B. Reay, *The Quakers and the English Revolution*, 1985, p. 39.
[188] Jennings, *The Gathering*, p.269; Reay, *The Quakers*, p. 20.
[189] Jennings, *The Gathering*, pp. 260, 261.
[190] Reay, *The Quakers*, pp. 41, 42, 50
[191] Jennings, *The Gathering,* p. 244*:*
[192] C.H. Firth, *Cromwell's Army,* 1902, pp. 34, 35.

This essay will focus on the New Model Army, for which there is relatively full information. It was also the most radical of all of parliament's armies, playing the major role in the outcome of the war. According to Ian Gentiles, 'while the number of horse [in the New Model] remained fairly stable between roughly 5,000 and 6,500, the foot and the dragoons underwent violent fluctuations in numbers, from 18,000 to 7,000, owing to massive desertions. The men who stamped the New Model with a distinctive character were therefore a tight group numbering about 5,000 horse and 7,000 foot.'[193] It is these fluctuations which make statistical analysis so difficult, and it is therefore necessary to rely mainly on literary evidence.

The origin of the social status of the New Model Army lies in the recruitment of officers to the Eastern Association. One of the officers of the army, Dodson a native of the Isle of Ely, had served with Cromwell from the outbreak of the war, and described how Cromwell had packed the army with officers sympathetic to the sectaries – that in choosing officers for his own regiment, he had dismissed 'honest gentlemen and souldiers that ware stout in the cause', and replaced them 'with common men, pore and of meane parentage, onely – he would give them the title of godly pretious men'.[194] Whitelocke, another contemporary, described Cromwell's men 'as being mostly freeholders and freeholders' sons, who had engaged in this quarrel upon a matter of conscience.'[195]

However there is some evidence that in the early years the aristocracy and gentry played a significant role in the parliamentary army. Baxter claimed that when 'the Earl of *Essex* came to *Worcester*, with many Lords and Knights, and in a flourishing [parliamentary] army, [they were] gallantly cloathed ...'[196] This was confirmed by another source which claimed that in the parliamentary army 'only seven of the new colonels were not gentlemen, and of nine of them were from noble families.'[197] This was in the early stages of the civil war when constitutional concerns were the dominant issues. In June 1647 there was a purge of conservative presbyterian officers from the army, including 'some of the most socially distinguished of the army's founders.'[198]

The discipline for which the New Model was famous for originated in the way Cromwell treated his troops. 'At Huntingdon, two troopers who tried to desert were whipped in the market place ... Colonel Cromwell had 2,000 brave men, well disciplined; no man swears but he pays his twelve pence; if he be drunk he is set in the stocks, or worse, if one call the other "Roundhead" he is cashiered ...'[199] This religious zeal was partly responsible for the discipline that the New Model Army showed in battle, allowing them to defeat royalist armies. However, this was also the result of harsh discipline 'including penalties for drunkenness and fornication; blasphemers [who] had their tongues pierced with a hot iron.'[200] The army also had a reputation for being 'the praying army'[201], and their religious faith along with their discipline 'explained why small handfuls of New Model soldiers were able to put much larger numbers of royalists to flight.'[202] As the Venetian ambassador observed of the New Model, 'This much is certain that the troops live as precisely as if they were a brotherhood of monks ... It was observed in the late wars that when the royal forces gained a

[193] I. Gentiles, *The New Model Army in England, Ireland and Scotland, 1645-1653,* 1992, p. 40.
[194] Holmes, *The Eastern*, p. 199.
[195] A. Fraser, *Cromwell Our Chief of Men,* 1974, p. 100.
[196] Baxter, *Reliquiare Baxterianae*, p. 42.
[197] Purkiss, *The English,* p. 421.
[198] I. Gentiles, 'The New Model Officer Corps in 1647: a collective portrait', *Social History,* 22:2 (1997), p. 130.
[199] Ibid, p. 101.
[200] R. Tombs, *The English and their History,* 2015, p. 230.
[201] Gentles, *The New Model Army, 1645-53*, p. 94.
[202] Ibid, p. 95.

victory they abandoned themselves to wine and debauchery, while those commanded by Cromwell, after their greatest successes were obliged to pray and fast.'[203]

According to Anthony Fletcher, 'the instructions sent to [royalist] commissioners of array made it quite clear ... that the officers were all 'persons of quality' with considerable local estates.'[204] Cromwell largely concurred with this analysis, claiming that he had confronted Hampden about parliamentary soldiers in the early period of the civil war, stating that 'your troopers ... are most of them old decayed serving men and tapsters, and such kind of fellows, and, said I, their troopers are gentlemen's sons, younger sons, persons of quality: do you think that the spirits of such base and mean fellows will ever be able to encounter gentlemen that have honour, courage and resolution in them?'[205]

There is other evidence to confirm this statement. According to one source 'the King's forces in the windy summer morning looked magnificent, with bright fluttering banners of every colour and fantasy, as the light flashed from polished breastplates, glowed on damask banners, taffeta scarves and velvet cloaks.'[206] Cromwell was moved to prayer: 'When I saw the enemy draw up and march in gallant order towards us, and we a company of poor ignorant men ...'[207] According to Gentiles

> All Charles's officers at Oxford from the rank of captain upwards, were of gentry or more exalted status. His regimental commanders early in the war were all noblemen or higher gentry. Throughout the whole royalist army fully 90 per cent of the regimental commanders were gentlemen or peers ... the practice of promoting men from the ranks, which was so common in the New Model, was wholly absent in the Oxford army.[208]

The difficulty in analysing the New Model's composition is that 'of the total officer corps in 1648, half came from backgrounds so obscure that no information can be recovered about them.'[209] However, Gentles who has made the most detailed study of them concluded that of the officers in 1647 'twenty-two – about 9 per cent of the total – are known to have had some form of higher education ... Thirty-seven men or about one-sixth ... are known to have risen from non-commissioned rank ... [and] a high proportion ... even at the rank of colonel, were men of relatively low social status ... it is the strongly urban character of the officer corps that is most striking.' [210]

These conclusions are confirmed by literary accounts by both royalists and parliamentarians. The royalist Denzil Holles, believed that the officers 'from the general ... to the meanest sentinel, are not able to make a thousand a year lands; most of the colonels are tradesmen, brewers, tailors, goldsmiths, shoemakers and the like.'[211] According to another hostile contemporary account it claimed that if you 'Deduct the weavers, tailors, brewers, cobblers, tinkers, carmen, draymen, broom-men, and then give me a list of the gentlemen. Their names may be writ in text, within the compass of a single halfpenny.'[212] The Earl of Manchester wrote in 1645, that Cromwell had chosen for his army 'not such as were soldiers

---

[203] Relatzione of England by Giovanni Sagredo, 1656, Razzell, *The English Revolution*, p. 19.
[204] Fletcher, *The Outbreak,* p. 356.
[205] I. Roots (ed.), *Speeches of Oliver Cromwell*, 1989, p 134. See also Ibid, p. 10; Yule, *The Independents*, p. 60.
[206] Wedgwood, *The King's War*, p. 452.
[207] Ibid, p.452.
[208] Gentiles, 'The New Model Officer Corps in 1647', p. 143.
[209] Hutton, *The British Republic*, p. 6.
[210] Gentiles, 'The New Model Officer Corps in 1647', pp. 135, 137, 140, 143,
[211] F. Maseres, 'Memoirs of Denzil Lord Holles', *Select Tract Relating to the Civil Wars in England in the Reign of Charles the First*, 1815, p. 277.
[212] *Mercurius Elencticus*, 7-14 June 1648.

or men of estates, but such as were common men, poor and of mean parentage, only he would give them the title of godly, precious men.'[213]' In August 1643 Cromwell justified his mode of selection in a famous speech.

> It may be it provoked some spirits to see such plain men made captains of horse. It had been well that men of honour and birth had entered into these employments, but why do they not appear? Who would have hindered them? But since it was necessary the work must go on, better plain men than none. ... I had rather have a plain russet-coated captain that knows what he fights for and loves what he knows than what you call a gentleman and is nothing else.[214]

In a vindication of the New Model from the charge of intending to sack London, published in the summer of 1647, it is asserted: 'There are verie few of us, but have most of this world's interest in the Citie of London, being chiefly and principally raised thence, and verie many, especially of our officers, being citizens themselves having their wives and children therein.'[215]

Samuel Pepys in his diary for the ninth December 1663 confirmed the role of London artisans and tradesmen in the New Model Army:

> of all the old army now, you cannot see a man begging about the street. But what? You shall have this Captain turned a shoemaker, the lieutenant, a Baker; this, a brewer; that, a haberdasher; this common soldier, a porter; and every man in his apron and frock, etc, as if they had never done anything else – whereas the other [cavaliers] go with their belts and swords, swearing and cursing and stealing – running into people's houses, by force oftentimes, to carry away something. And this is the difference between the temper of one and the other ...[216]

Previously on the 4th July 1663 while watching the royal army parade through London, he had observed that 'all these gay men [royalist horse and foot] are not the soldiers that must do the King's business, it being such as these that lost the old King all he had and were beat by the most ordinary fellows that could be.'[217]

It was the junior officers of the New Model who frequently undertook independent political action, such as Cornet Joyce's seizing of the king at Holdenbury and placing pressure on Cromwell and the senior officers to bring the king to trial and eventual execution.[218] The wealthy Presbyterians who dominated London's government at this time, attempted to block the New Amy's access to parliament in 1647, but this was thwarted by the army sweeping away the resistance of the trained bands.[219] The New Model was reinforced by volunteers raised by Skippon in the suburbs, who were 'predominantly servants and apprentices'.[220] It is no accident that the New Model had been able to gain access to London Bridge through Southwark, which had long been a support of the radicals both in parliament and the army. This culminated in the purging of parliament led by Colonel Pride, leaving a rump of about 70 Independent MPs.[221]

---

[213] C. Hill, *God's Englishman: Oliver Cromwell and the English Revolution*, 1970, pp. 65, 66.
[214] Ibid, pp. 66, 67.
[215] C.H. Firth, *Cromwell's Army: a History of the English Soldier during the Civil War*, 1912, p. 47.
[216] Latham and Matthews, *The Diary*, Volume 4, 1995, pp. 373, 374.
[217] Ibid, p. 217.
[218] B. Coward, *Cromwell: Profiles in Power,* 1991, p. 50.
[219] J. T. Schroeder, 'London and the New Model Army, 1647', *The Historian*, Volume 19, No. 3, May 1957, p. 249.
[220] L. C. Nagel, *The Militia of London, 1641-1642,* D.Phil. Thesis, Kings College, University of London, p. 303.
[221] Flintham, *Civil War*, p. 41.

In order to confirm the low social status of the New Model, an analysis has been carried out to compare the socio-economic status through university attendance of Royalist and New Model officers during the civil war period. The essence of the analysis is to make a comparison using an identical methodology for both armies. It indicates that the Royalist officers were of significantly higher social status than those of the New Model, confirming the literary evidence reviewed above.

Table 5: Proportions of Royalist and New Model Army Officers Graduating from Oxford and Cambridge Universities.[222]

	Total In Sample	Number Graduating from Oxford	Number Graduating from Cambridge	Total Proportion Graduating
Royalist Officers, 1642-60	100	27	25	52%
New Model Officers, 1645-49	100	9	6	15%
New Model Officers, 1649-63	100	7	10	17%

There are probably too many false positives in all samples, as suggested by Gentles' finding that only nine per cent of New Model Army officers had received a higher education in 1648, including at the Inns of Court. This suggests that most of these officers were from non-gentry backgrounds.

Conclusion

The revolutionary nature of Cromwell's regime is indicated by a speech he made to the army in 1651 when Charles II threatened to invade England with a Scottish army:

> Cromwell announced to the Army that, if he should fall, England would witness a universal crisis and change the numerous colonels, in all their splendour, who were once tailors, goldsmiths and carpenters [and] would have to make way for the nobility and courtiers.[223]

Aristocrats replaced by tradesmen and artisans in the army – indicating the only social revolution ever to occur in England. The New Model Army was a reflection of a social class which had been influenced by the Leveller movement, holding radical ideas about 'the fundamental rights and liberties ... against all arbitrary power, violence and oppression.'[224] This was an extension of the principles that had led parliament originally to object to Charles I's attempt to impose arbitrary government, a reflection of a culture of individualism. This was a culture particularly associated with literate socio-economic groups, a rebellious culture which could not be suppressed because of the absence of a national army in England.

[222] The above figures are based on a hundred cases selecting the first five names in each alphabetical letter in the relevant biographical dictionaries, covering most alphabetical letters. Only names not appearing in C. Webb's *London Bawdy Court, Consistory Court of London,* Volume 1, 1703-13, 1999 were selected for analysis, in order to avoid common names. The royalist figures are taken from P.R. Newman, *Royalist Officers in England and Wales, 1642-1660: A Biographical Dictionary,* 1981; the New Model Army ones are derived from M. Waklyn, *The New Model Army, Volume 1, 1645-49*, 2015 and M. Waklyn, *The New Model Army, Volume 2, 1649-1663,* 2016. The search for university membership was made through the online alumni listings for both universities.
[223] Relatzione of England by Giovanni Sagredo, 1656, Razzell, *The English Revolution*, p. 19.
[224] Morrill (ed.), *Reactions*, p. 183.

It was a culture originating in London and other trading towns of England, as well as the pastoral and woodland areas free of manorial control, which in the sixteenth and seventeenth centuries was often associated with puritanism. London's role was expressed most eloquently by the poet John Milton, who described in 1641 his fellow Londoners 'sitting by their studious lamps, musing, searching, revolving new notions and ideas ... reading trying all things, assenting to the force of reason ...'[225] This quote indicates not only the basis of puritanism – the rational scrutiny of all ritual and belief – but also the foundation for the process of rationalisation analysed by Weber in his discussion of the protest ethic.

Religion became more radical over time, with lesser socio-economic groups coming to dominate the religious and political agenda. It ultimately led to a revolution which involved the trial and killing of the king, the abolition of the House of Lords and the establishment of a republic. This never had the support of the majority of the population, which objected to the control of a standing army and a culture of puritanism. Cromwell had attempted to establish a regime of military control through the Major-Generals, which was unsuccessful. He along with the army officers had also attempted to introduce various forms of parliament, including Barebones Parliament with an emphasis on M.Ps sympathetic to the Puritan cause. All these regimes unravelled partly on libertarian grounds – with the soldiers of the New Model insisting on a 'liberty of conscience'. According to Baxter

> many honest men [in the New Model Army] ... made it ... their religion to talk for this Opinion and for that; sometimes for State Democracy, and sometimes for Church Democracy; sometimes against Forms of Prayer, and sometimes against Infant baptism, (which yet some of them did maintain); sometimes against Set-times of Prayer, and against the tying of ourselves to any Duty before the Spirit move us ... and sometimes about Free-grace and free-will, and all the Points of Antinomianism and Arminianism ... But their most frequent and vehement Disputes were for Liberty of Conscience as they called it ... [226]

This range of views anticipated the growth of nearly all the dissenting congregations in England and Wales during the eighteenth and nineteenth centuries. This radical diversity of opinion made it difficult to find a religious and political settlement. The Presbyterians had attempted to impose a Puritan settlement along Scottish lines, but with the overall control of parliament, but this was opposed by the New Model with its insistence on liberty of conscience, again reflecting an individualistic culture.[227]

It was perhaps because of these difficulties that led Crowell to eventually advocate a return to a conservative society. In a speech to parliament in 1654 he claimed that 'a nobleman, a gentleman, and a yeoman ... That is a good interest of the nation and a great one.'[228] It was because of this conservatism that he had suppressed the Leveller movement, including the imprisonment and execution of three soldiers at Burford in 1649.[229] Towards the end of his life Cromwell attempted to purge the army of radicals and introduce aristocrats into his personal circle. According to Lucy Hutchinson

> He weeded, in a few months' time, above a hundred and fifty godly officers out of the army, with whom many of the religious soldiers went off, and in their room abundance of the king's dissolute soldiers were entertained; and the army was almost changed from that godly religious army, whose

[225] Worden, *The English Civil Wars*, p. 79. In 1650 Wallington a London artisan noted in his diary that he had not only written 'above forty books and read over the Bible many times,' but had also read 'above two hundred other books'. P. S. Weaver, *Wallington's World: a Puritan Artisan in Seventeenth Century London*, 1985, p. 5.
[226] Baxter, *Reliquiare Baxterianae*, p. 53.
[227] Razzell, *English Civil War,* Volume 3, p. 287; Underdown, *Revel*, pp. 208, 247.
[228] Coward, *Cromwell*, p. 102.
[229] See also Purkiss, *The English*, p. 499.

> valour God had crowned with triumph, into the dissolute army they had beaten, bearing yet a better name ... Claypole, who married his daughter, and his son Henry, were two debauched cavaliers ... His court was full of sin and vanity, and the more abominable, because they had not yet quite cast away the name of God ... hypocrisy became an epidemical disease ... At last he took upon himself to make lords and knights ... Then the Earl of Warwick's grandchild and the Lord Falconbridge married his two daughters ... [230]

However on the 15th March 1658 the Venetian ambassador reported that

> ... the Army took very badly the cashiering of the officers, reported, and has made a vigorous remonstrance to the Protector, pointing out that officers cannot be dismissed from an army without a Council of War, and so, as they do not know for what reasons he sent away many of their colleagues, they ask him to restore them to their posts and, by order of His Highness, they have been reinstated in them a few days since ...[231]

Cromwell's attempted changes laid the foundation for the restoration of the crown and a traditional parliament, although many of the provincial members of the New Model Army continued to be attached to 'the Good Old Cause' and political radicalism. For example

> Even in Deal, (after the Restoration a great centre of Nonconformity) maypoles were set up on May day 1660, and the people set the King's flag on one of them to the fury of the soldiers in the castle who 'threatened, but durst not oppose.'[232]

Something similar occurred in Nottingham in 1660, when a confrontation occurred 'between the young men of the town who were demonstrating for the return of the king, and soldiers of Colonel Hacker's regiment. The Memoirs [of Lucy Hutchinson] tell us that "the soldiers, provoked to rage, shot again and killed in the scuffle two Presbyterians ..."' [233] By 1660 the general population had turned against the Cromwellian regime and the soldiers in Deal Castle were powerless to prevent this popular revolt.

Cromwell concluded before this period that a new constitutional settlement was necessary, and declared to an audience of army officers deeply opposed to change: 'It is the time to come to a settlement and lay aside arbitrary proceedings, so unacceptable to the nation.'[234] However, puritanism and a culture of individualism did not disappear, but was reflected in the rise of religious dissent and a more extensive development of capitalism. Both individualism and capitalism have come to shape modern England, which has dominated economic, social and political life in the twenty-first century.

---

[230] Hutchinson, *Memoirs*, pp. 294, 295.
[231] Razzell, *English Civil War,* Volume 5, p. 83.
[232] M. V. Jones, *The Political History of the Parliamentary Boroughs of Kent, 1642-1662* (London University Ph. D. Thesis, 1967), pp. 467, 468.
[233] Jennings, *The Gathering*, p. 160.
[234] Coward, *Cromwell*, p. 146.

Max Weber and Environmental Determinism

The process of rationalization was seen by Weber as occurring within the occidental world at periodical intervals: in ancient Greece, Renaissance Italy, Puritan Holland and England. It is not therefore in practice conceived by him as a linear cultural development or a series of unique accidental events, but a process which perennially but cumulatively repeats itself in the Occident. And it was this which led him against his own methodological inclinations to refer to the process of rationalization as a 'law of development'.

Weber was also forced by the logic of his own analysis to raise the possibility of a racial determination of occidental culture, but at the same time indicated what the only alternative explanation was an environmental one. In practice he conceived environmental explanations as being historical and these cannot solve "the special peculiarity of Occidental rationalism." Yet in principle the nature of a satisfactory solution to Weber's problem is to be found through the logic of scientific analysis. If social science is viewed as a natural scientific discipline which gives an objective casual account of social reality – as this paper does – then in the last resort this environmental factor must be a geographical one.

The logic is this assertion is as follows: 1. Heredity and environment exhaust the range of possible natural scientific explanations. 2. Subjective voluntaristic theories of social action are logically incapable of explaining systematic societal variations because of randomization of individual action. 3. Heredity also cannot explain societal variations because of this process of randomization – this assumes that biological race does not determine culture. 4. The only remaining factor which is both environmental and objective is geographical environment.

Weber himself did not discuss the nature of sociological explanations in terms of the environment. Talcott Parsons has attempted however to develop Weber's theory of social actions in a more systematic fashion and has dealt with the problem of environmental explanations as a general theoretical level. In the summary of his theoretical position in *Societies: Evolutionary and Comparative Perspectives*, Parsons distinguished two 'environments of action': the 'physical-organic environment' and 'ultimate reality'[1] The former refers essentially to the

[1] T. Parsons, *Societies: Evolutionary and Comparative Perspectives,* 1966, p. 20.

geographical environment but would also include all forms of biological life other than man himself.

"Ultimate Reality" is so ambiguous as to require clarification. At first sight it might appear to refer to ideas that men have about such a reality, but Parsons makes it very clear that his referring to an 'environment of action', i.e. an environment external to all modes of social action inducing religious ideas. That this is not an accidental use of words, but a fundamental part of Parsons' analysis is revealed in his earlier writings. The most telling summary of these is his discussion of Durkheim's ideas on religion in *The Structure of Social Action*:

> Religious ideas, then, may be held to constitute the cognitive bridge between men's active attitudes and the non-empirical aspects of their universe . . . The specific content of religious ideas is no more completely determined, probably not nearly as much, by the intrinsic features of the non-empirical than is scientific knowledge completely determined by the 'external world'.[2]

What Parsons is saying here is that the 'non-empirical world' is in part a determinant of men's religious ideas – not exactly Hegel's 'God in History', but at least an indeterminant supernatural/metaphysical force at work. This explicit supernatural idealism at least has the merit of pointing out the logic of Parsons' 'cultural determinism', and it allows us to decisively reject such idealism as being incompatible with sociology as a natural scientific discipline. However, it must be pointed out that it has been possible for Parsons to present such an argument as a scientific one, because his theory of social action has the authority of research derived from Weber. Parsons erroneously confused a scientific analysis of social action with a particular kind of scientific orientation on the part of the social actor himself. In fact, it is in principle just as valid to give a scientific explanation of 'irrational' non-scientific ideas and orientations as it is of 'rational' scientific ones. If we eliminate Parsons' 'ultimate reality' as a causal variable in sociological analysis – and if we subscribe to the notion of sociology as a natural social science, we must – the only theoretically valid part of his analysis of environments is that part which deals with the objective observable 'physical-organic environment'.

---

[2] T. Parson, *The Structure of Social Action*, Volume 1, 1968, p. 424. See the discussion of Durkheim's treatment of religious ideas by Parsons: Ibid, pp, 411-429. For his position on the role of non-empirical reality in explaining cultural facts, see also his article 'The place of ultimate values in sociological theory', *Ethics*, Volume 45, 1934-1935.

Both Marx and Durkheim came near to applying this principle of objective environmental analysis in their sociological work. Marx's 'materialism' and emphasis on the economic determinants of social life is compatible with geographical determinism, although he only occasionally located his analysis in a specific geographical context. Environmental determinism is also compatible with non-economic explanations of social facts, in particular those made in terms of political structures. Durkheim accepted in principle the sociological importance of geographical environment but in practice was much more interested in another objective determinant of social life – changes in population density. However, alterations in population density can account for historical processes of change but not for systematic variations in the development of different societies. For the question must always be raised: as to why population grew in one type of society and not another?

Of course, population does change in a particular society for 'accidental' reasons – perhaps an example of this is the appearance and disappearance of the plague in Europe – but this kind of change cannot account for systematic changes in the social structure in several different contexts that interested Weber. Rationality appears and reappears so systematically in occidental societies that he was forced to search for some 'fixed' factor which was a 'constant' in the historical process – and if we reject the constant factor of biological race, as we must, the only other factor which is both objective and relatively unchanging is geographical environment.

It might be objected that geographical environment cannot be a "determining cause of social development, for that which remains almost unchanged in the course of tens of thousands of years cannot be the chief cause of development."[3] What can be explained by geographical environment is variations in the process of development between different societies – historical development itself is brought about by factors such as technological innovation and the process of intellectual rationalization. Similarly, biological evolutionary theory locates biological changes in the context of geographical environments. The genetic mechanisms of biological change are quite distinct from the process of natural selection: the former is primarily a function of 'random' genetic mutations, the latter a function of adaptations to geographical environments.

---

[3] A statement made by Stalin quoted in K.A. Wittfogel, *Oriental Despotism*, 1957, p. 408. However, Dartnell has recently argued that a relatively rapid change in the environment led to the physical development of modern man. See L. Dartnell, *Origins: How the Earth Shaped Human History*, 2019, pp. 24, 25.

Although Weber rejected the above kind of argument on account of his methodological idealism, in practice he came near to applying it in his actual attempt to explain cultural variations between one society and another. For example, his explanation of the emergence of the free artisan in northern Europe:

> In antiquity the slaves remained in the power of the lord, while in the Middle Ages they became free. In the latter there is a broad stratum of free craftsmen unknown to antiquity. The reasons are several: the difference in the consumptive requirements of the Occident as compared to all other countries of the world . . . The contrast rests on climatic differences. While in Italy heat is not indispensable, even today, and in antiquity the bed counted as a luxury – for sleeping one simply rolled up one's mantle and lay down on the floor – in Northern Europe stoves and beds were necessities. The oldest guild document which we possess is that of the bed ticking weavers of Cologne . . . again in consequence of climatic relations, the German appetite was greater than that of the southerner.[4]

And in this context, Weber might have added the commonplace observation that the temperate climate of the northern European countries is much more conducive to the protestant ethic of work than that of the hot southern countries. Weber's most comprehensive statement concerning the environmental determinant of cultural variations is to be found in his study of the religion of China:

> In sharp contrast with the Occident, but in harmony with Indian conditions, the [Chinese] city as an imperial fortress had fewer formal guarantees of self-government than the village . . . This can be explained in terms of the different origins of the occidental and oriental city. The polis of antiquity originated as an overseas trading city, however strong its base in landlordism, but China was predominantly an inland area . . . On the other hand, the characteristic inland city of the occidental Middle Ages, like the Chinese and the Middle Eastern city, was usually founded by princes and feudal lords in order to gain money rents and taxes. Yet at an early date the European city turned into a highly privileged association with fixed rights. These could be and were extended in a planned manner because at the time the lord of the city lacked the technical means to administer the city. Moreover, the city represented a military association which could successfully close the city gate, by an army of knights.

---

[4] M. Weber, *General Economic History*, 1961, p. 107. For other examples of Weber's analysis of cultural facts in terms of the climate see M. Weber, *The Sociology of Religion*, p. 98.; M. Weber, *The Rational and Social Foundations of Music*, 1958, p. 24.

> In contrast, the great Middle Eastern cities, such as Babylon, at an early time were completely at the mercy of the royal bureaucracy because of canal construction and administration. The same held for the Chinese city despite the paucity of Chinese central administration. The prosperity of the Chinese city did not primarily depend upon the citizen's enterprising spirit in economic and political ventures but rather upon the imperial administration, especially the administration of rivers.[1]

This statement of Weber's could very easily be mistaken for one made by Marx on the theme of 'oriental despotism', with its emphasis on the role of economic factors and its general geographical materialism.[5] Weber was very aware of the possibility of an "explanation of a political structure from its geographical background."[6]

> Royal bureaucracies (in the East) were developed to carry out the regulation of river traffic and execution of irrigation policy with the consequent establishment of a process leading towards the bureaucratization of the entire administration. This permitted the king through his staff and revenues supplied them to incorporate the army into his own bureaucratic management. . . No political community of citizens could arise on such a foundation for there was no basis for military independence of royal power.[7]

This emphasis on irrigation management for explaining 'oriental despotism' has been developed in detail by Wittfogel in his *Oriental Despotism*. The thesis has been subsequently attacked on empirical grounds that the administration of irrigation systems did not always require large-scale bureaucratic structures but in many cases was organized on a small-scale local basis.[8] However, it is possible to restate the hypothesis in a much more acceptable form, whereby the regional management of irrigation is only a stage, although a significant one, in the development of 'oriental despotism'. Julian Steward has come near to restating the hypothesis in this form and has added to it by invoking military

---

[5] For Marx's analysis of 'oriental despotism' see Wittfogel, op. cit,.

[6] The example of this in the text refers of course to the geographical determination of political structure via economic forces. Weber was also aware of the direct effect of geographical environment on political structure, e.g. his comments on the peculiar geographical position of Germany and the consequent effects on its political life. J.P. Mayer, *Max Weber and German Politics*, p. 20.

[7] M. Weber, *The City*, 1968, pp. 119, 120.

[8] See for example R. M. Adams, *The Evolution of Urban Society*, 1966, pp. 15, 66-68, 74, 76; *International Encyclopedia of Social Sciences*, 1968, Volume 1, p. 424 and Volume 16, pp. 204, 210.

[1] M. Weber, *The Religion of China*, 1968.

conquest as a further variable in the analysis.[9]

In the context of the present paper's emphasis on geographical determinism, military conquest would have to be analyzed in terms of physical accessibility of one region to another through factors such as navigable seas, lakes, rivers and canals. It is likely however, that other geographical variables are also important in explaining the emergence of 'oriental despotism' in particular societies.

Emerging out of this part of Weber's work which deals with the geographical determinants of culture, is the theme that some geographical environments through economic and political forces create the social conditions which free men for independent action, whereas others force men into personal dependency. The former was seen by Weber in terms of the occidental city where "city air makes man free".[10] The latter was viewed by him mainly in the context of 'oriental despotism' which arose out of the 'iron cage' of bureaucratic control. Freedom was the crucial factor in the development of rationality. This was true according to Weber in three major contexts: 1. "A powerful organization of priests" possessing "the greatest measure of independence from political authorities".[11] 2. Prophets as lay preachers with powers of "sovereign independence".[12] 3. "The peculiar freedom of urbanites" in the occidental city.[13] Weber never spelt out the reasons for this association between freedom and rationality but there are suggested explanations in negative statements such as he made in his study of methodology:

> The points of departure of the cultural sciences remain changeable throughout the limitless future as long as a Chinese ossification of intellectual life does not render mankind incapable setting new questions to the eternally inexhaustible flow of life.[14]

His reference to "a Chinese ossification of intellectual life" is of course employed here as a metaphor for what Weber feared would be the consequence of the spread of bureaucratic control in modern life.

---

[9] See J. Steward (ed.), *Irrigation Civilizations: a Comparative Study*, 1995, pp. 1-5, 58-78.

[10] Ibid, p. 94.

[11] Weber, *Sociology of Religion*, p. 73.

[12] Ibid, p. 78.

[13] Gerth and Mills, *From Max Weber*., p. 269.

[14] Weber, *Methodology*, p. 84. Weber recognized of course that there was a significant amount of rationalization in Chinese and other oriental cultures, but it was his view that it had become 'ossified' in the oriental world in a way that it had not in the Occident.

Rationality results from freedom through the critical questions that individuals are naturally predisposed to ask through the "metaphysical needs of the human mind as it is driven . . . understand the world as a meaningful cosmos." The 'iron cage' of bureaucracy inhibits the development of rationality because it stereotypes the questions that men ask through the process of routinization and centralized control.

Recent Research on Environmental Determinism.

Although environmental determinism and cultural evolutionary theory became unfashionable during the first half of the twentieth century, there has been a significant revival of interest in both these approaches, particularly in the writings of American anthropologists.[15]. The most important attempt to revive geographical determinism was Julian Steward's work on cultural ecology.[16] There has not yet however to be successful integration of the evolutionary and ecological approaches comparable to the synthesis achieved by biological theory.

There has been a recent resurgence of interest in environmental determinism which has been conveniently summarized and detailed by Wikipedia as follows:

1. Ibn Khaldun has argued that soil, climate, and food determined whether societies were nomadic or sedentary, shaping their customs and ceremonies.[17]
2. Ellen Churchill Semple's case study focused on the Philippines, where she analyzed patterns of civilization and wildness in relation to the topography of its islands.[18]

---

[15] For writings on evolutionary theory see L. White, *The Evolution of Culture*, 1959; MD. Aahlins and E.R. Service (eds.), *Evolution and Culture*, 1960; M.H. Fried, *The Evolution of Political Society*, 1967 and M. Harris, *The Rise of Anthropological Theory*, 1969. For recent publications on environmental determinism see R. Kaplan, *The Revenge of Geography,* 2013*;* T. Marshall*, Prisoners of Geography*, 2015*;* L. Dartnell*, Origins: How the Earth Shaped Human History*, 2019.

[16] J.H. Steward, *Theory of Culture Change*, 1963; M.D. Coe and C.P. Kottak, 'Social typology and tropical forest civilizations', *Comparative Studies in Society and History*, Volume 4, 1961-1962.

[17] See A. Hannoum, *Translation and the Colonial Imaginary: Ibn Khaldun Orientalist*, 2003.

3. Daron Acemoglu, Simon Johnson and James A. Robinson concluded that geography was the most important influence on institutional development during early state formation. However, they argued that geographic factors cannot directly explain differences in economic growth after 1500 A.D., except through their effects on economic and agricultural productivity.[19]
4. Jeffrey Sachs and John Luke Gallup have examined the role of geography on coastal trade and access to markets, as well as its impact on disease environment and agricultural productivity.[20]
5. Jared Diamond has concluded that early states located along the same geographical latitude made it easier for the spread of crops, livestock, and farming techniques. Regions suitable for the cultivation of wheat and barley saw high population densities and the growth of early cities. Resulting writing systems gave people the ability to store and build knowledge. A surplus of food enabled craftsmanship to flourish allowing some groups the freedom to explore and create, which lead to the development of metallurgy and advances in technology. The close proximity in which humans and their animals lived led to the spread of disease across Eurasia. Europeans took advantage of their environment to build large and complex states with advanced technology and weapons. The Incas and other native groups in South America did not have these advantages, and suffered from a north-south orientation that prevented the flow of goods and knowledge across the continent.[21]
6. Dr Marcella Alsan argued that the prevalence of the tsetse fly hampered early state formation in Africa. Because the tsetse virus was lethal to cows and horses, communities afflicted by the insect could not rely of agricultural benefits provided by livestock. The disease environment hindered the formation of farming communities, and as a result, early African societies resembled small hunter-gatherer societies rather than centralized states.[22]
7. Stanley Engerman and Kenneth Sokoloff examined the economic development of the Americas during colonization. Specific factor

---

[18] J. Painter, *Political Geography: an Introduction to Space and Power*, 2009, p. 177.

[19] D. Acemoglu and J. Robinson, *Why Nations Fail: The Origins of Power, and Poverty*, 2012.

[20] J.D. Gallup, J.D. Sachs and A.D. Mellinger, 'Geography and economic development', *International Regional Science Review,* Volume 22**,** 1999.

[22] See M. Alsan, 'The effect of the tsetse fly on African development", *American Economic Review*, Volume 105, 2015.]

endowments in each colony affected their growth. The development of economic institutions, such as plantations, was caused by the need for a large amount of land and a labour force capable of harvesting sugar and tobacco, while smallholder farms thrived in areas where large scale economies were not suitable for the environment. They also found smallholder economies to be more equitable since they discouraged an elite class forming and distributed political power democratically to most land-owning males. Colonies with educated and free populations were better suited to take advantage of technological change during the industrial revolution, granting country wide participation into the booming free-market economy.[23]

8. Historians have also noted that population densities seem to concentrate on coastlines and that states with large coasts benefit from higher average incomes compared to landlocked countries. Coastal living has proven advantageous for centuries as civilizations relied on the coastline and waterways for trade, irrigation, and as a food source. However, factors including fertile soil, nearby rivers, and ecological systems suited for rice or wheat cultivation can give way to dense inland populations.[24]
9. Nathan Nunn and Diego Puga note that rugged terrain usually makes farming difficult, prevents travel, and limits societal growth. Harsh terrain hampered the flow of trade goods and decreased crop availability, while isolating communities from developing knowledge and capital growth. However, harsh terrain had positive effects on some African communities by protecting them from the slave trade. Communities that were located in areas with rugged features could successfully hide from slave traders and protect their homes from being destroyed.[25]
10. Locations with hot tropical climates often suffer underdevelopment due to low fertility of soils, excessive plant transpiration, ecological conditions favouring infectious diseases, and unreliable water supply. These factors can cause tropical zones to suffer 30% to 50% decrease in productivity relative to temperate climate zones.[26]

---

[23] S. Engerman and K. Sokoloff,, *Economic Developments in the Americas since 1500: Endowments and Institutions*, 2011.

[24] J.D. Gallup, J.D. Sachs and A.D. Mellinger, 'Geography and economic development', *International Regional Science*, 22, 1999.

[25] N. Nunn and D. Puga, 'Ruggedness: The blessing of bad geography in Africa", *The Review of Economics and Statistics*, Volume 94, 2012

[26] Gallup, Sachs and Mellinger, 'Geography'; W. Easterly and R. Levine, 'Tropics, germs, and crops: how endowments influence economic development', *Journal of Monetary Economics,* Volume 50, 2003.]

Conclusion

There are a number of critical questions which can be asked of Weber's argument about the social process of the development of freedom and rationality which are beyond the scope of this paper. In conclusion however, it is necessary to point out that Weber's analysis lacked depth in certain areas because of the neglect of the details of what might be termed the 'materialistic' dimension. Not only did he fail to discuss in detail the effect of geographical environments on social structure and cultures, but he also neglected the analysis of the most important factor in the evolution of culture: the development of technology.[27] His methodological idealism did however allow him to develop an analysis of the process of intellectual rationalization. His great achievement was to establish the cultural conditions necessary for freedom and the development of rationality, and the psychological consequences of the process of rationalization which led to a sublimated ethic of work. However, he only hinted at the links between geographical environment and economic and political structures and their impact on cultural development.

Weber's emphasis on freedom is consistent with the growth of capitalism, which occurred particularly in England, Holland and elsewhere where there was an absence of major political constraints. Weber gave several reasons why England differed from continental powers: 'As a result of its insular position [as an island] England was not dependent on a great standing army.' On the continent it was possible for the state to protect its peasantry through its standing army, but in England this was not possible. As a result, England 'became the classical land of peasant eviction. The labour force this threw on the market made possible the development of the domestic small master system ... Thus, while in England shop industry arose, so to speak, by itself, on the continent it had to be deliberately cultivated by the state ... This is by no means

[27] Weber did however, analyze in some detail the development of economically more rational forms of social organization. He correctly saw the process of bureaucratization as a form of 'social technology'. For Weber's belief in the inevitable evolution of society towards a structure built on 'mechanized foundations' see Mayer, *Max Weber*, pp. 126, 127.

fortuitous, but is the outcome of continuous development over centuries ... the result of its [England's] insular position.'[28]

This was the result of environmental factors which hampered the growth of standing armies, with a reliance on navies and militias for defence. Weber's methodological idealism was probably responsible for his relative neglect of the role of material and geographical conditions. However, he laid the groundwork for the further scientific work necessary for answering the fundamental question as to why the process of rationalization first occurred in the occident than elsewhere.

[28] M. Weber, *General Economic History*, 1961, pp. 129, 130; M. Weber, *Theory of Social and Economic Organization*, 1964, p. 277.

This book is dedicated to the memory of my son
Luke Razzell

Essays in Historical Sociology

Peter Razzell

Caliban Books

Published 2021
Caliban Books
30Ingram Road, London, N2 9QA
Copyright Peter Razzell.
ISBN 978-1-5272-8724-2

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior permission of the copyright owner.

	CONTENTS	
Chapter		**Page**
Introduction		6
Chapter 1	The Problem of Determinism: A Sociological Solution	12
Chapter 2	The Protestant Ethic and the Spirit of Capitalism: a NaturalScientific Critique	42
Chapter 3	Max Weber and Environmental Determinism	74
Chapter 4	A Sociological Analysis of the English Civil War	88
Chapter 5	Malthus: Mortality or Marriage? English Population Growth in the Eighteenth Century	152
Chapter 6	The History of Infant, Child and Adult Mortality in London, 1538-1850	192
Chapter 7	Population Growth and the Increase of Socio-Economic Inequality in England, 1550 1850	229
Chapter 8	Socio-Economic Status and Adult Mortality in England: a Historical Study	248
Chapter 9	The Hazards of Wealth: Adult Mortality in Pre-Twentieth-Century England	262
Chapter 10	Introduction to Mayhew's Morning Chronicle Survey	298
Chapter 11	Asian Population Growth and the Increase of Economic Inequality in Britain	330

INTRODUCTION

Demography has been seen traditionally by economists and other social scientists as a function of economics, but this book presents detailed evidence to show that it has acted as an independent force influencing England's economic and social development through changes in disease patterns. Several essays in the book also illustrate the historical link between population growth and economic inequality, as well as the complex relationship between wealth, marriage and fertility.

My research on demographic history began as a student at Birmingham University. David Eversley in a lecture on population history pointed out that in spite of Malthus's theoretical emphasis on the role of economics in shaping fertility levels, his empirical work stressed the importance of mortality as the prime mover on England's demographic history. This influenced my own subsequent research, eventually concluding that population growth was largely shaped by disease patterns and mortality in the period between the sixteenth and twentieth century

I had graduated with a degree in sociology, and subsequently established a project on the social origins of army officers in the East Indian Company and the British Army. I found that there had been a significant increase in the number of gentry and aristocratic officers into these armies at the end of the eighteenth century. I explored the factors which might have been involved in this transition and found that there had been a major growth in life expectancy amongst county families. Given the wealth of these families, it suggested that non-economic factors were responsible for this reduction in mortality.

Further research indicated that this may have been primarily due to the introduction of smallpox inoculation, but later work indicated that this could have been only a part of the explanation. I found that the case-fatality rate of smallpox had grown from under five per cent in the late sixteenth century to about forty-five per cent among unprotected children in the late

nineteenth. Inoculation and vaccination had been effective in combating smallpox, but the increasing fatality of the disease meant that their impact on overall mortality was limited.

I established through a number of independent sources – censuses, apprenticeship indentures, and marriage licences – that there had been major fall in adult mortality from the early eighteenth century onwards, approximately halving between the beginning and end of the century, well before the introduction of inoculation. The reduction in mortality occurred in all socio-economic groups and in all areas of the country, suggesting an autonomous fall in overall disease mortality. Infant and child mortality reduced first among the wealthy from the middle of the eighteenth century onwards, indicating that life-style changes such as improved personal hygiene and midwifery practices, along with inoculation, may have been partly responsible for the mortality reductions. Part of my research involved an examination of Jenner's development of vaccination, concluding it was not based on cowpox but was a more attenuated form of the old smallpox inoculation.

When I graduated the prevailing assumption was that sociology was a natural science. This assumption has been increasingly challenged through philosophical debates about the nature of science, which included the role of determinism. Sociology has been recently dominated by what Weber called the historical cultural sciences, and there has been a growth in phenomenological sociology rejecting the deterministic assumptions of natural science. My work on disease and demography led to an analysis of the problem of determinism which forms chapter 1 of this book. This research led me to reject these new trends and confirm sociology as a natural science, providing the foundation for a discussion of Weber's *Protestant Ethic* thesis in the second essay. This includes an analysis of the process of rationalization and the growth of natural science, and their impact on cultural development, including 'the disenchantment of the world'. A subsequent paper

on Weber's work explores the influence of geographical environment on the growth of capitalism.

Much of the research on topics in this book has been hampered by the lack of reliable statistical evidence, creating controversies which have yet to be resolved. Attempts have been made by economic historians to solve these difficulties by adopting mathematical models, but these have resulted in significantly different conclusions. For example, Gregory Clark and Stephen Broadberry have both used elaborate mathematical models to establish long-term economic growth in England, but resulting in radically different conclusions. The problem is that there is no reliable national evidence to evaluate competing ideas, and they are unlikely to ever be resolved by econometric analysis.

Recently Thomas Piketty has criticized the 'immoderate use of mathematical methods', stressing that 'historical experience remains our principle source of knowledge.' The essays in this book are based on this approach, but with an emphasis on direct statistical and contemporary literary evidence. A methodology of triangulation has been adopted in order to ensure the reliability of data. I have applied this principle to demographic analysis by assessing the accuracy of the registration of births, marriages and deaths. This has been achieved through comparing independent measures of these events.

In addition to demography, I have explored in detail the role of geography in political, economic and cultural life. Geography like demography can be seen as an objective factor in shaping historical change. I have used triangulation in the sociological analysis of the English civil war, citing evidence from both supporters of parliament and their royalist enemies. Traditionally England did not rely on a standing army, but used the navy as the chief form of defence against external attacks. This was because of its geographical position as an island, which had a major influence on its political history. On the continent of Europe standing armies had been developed because of the threat

of land-based attacks, which strengthened authoritarian regimes and the power of monarchies. In the absence of land-based threats, English kings were forced to rely on militias which resulted in a limited ability to impose taxes and control the economy. As a consequence, a culture of individualism developed in England, particularly in areas outside the manorial control of the aristocracy and gentry.

These developments were linked to the growth of capitalism in England, and I illustrated this with a study of Shakespeare and his family. They were independent traders travelling throughout the country participating in a cosmopolitan economy. This included illegal lending of money and extensive speculation in trading of commodities. They and their fellow Stratford townsmen were associated with the local gentry who all engrossed grain during a period scarcity. Nearly forty per cent of Stratford's population were designated as poor, and they threatened to riot as a result increasing food prices. They appealed for support from the local landed magistrates without realising that they were some of the leading engrossers of grain.

During the late sixteenth and first half of the seventeenth century population had grown largely as a result of the gradual disappearance of plague. This led to increasing property prices due to a greater demand for food and other consumer goods. There was a marked rise in the wealth of yeomen farmers at this time, and along with tradesmen they became increasingly literate. These groups formed the backbone of Cromwell's New Model Army, playing a major role in the English civil war.

The later Regency period also saw a relationship between population growth and socio-economic inequality. Not only was there an increase in the pauperization of labourers as a result of growing surplus labour, but the increase in life expectancy amongst the gentry and aristocracy meant that they increasingly monopolized elite occupations.

Although relating to recent times, the last essay in this book describes the influence of Asian population growth on inequality in England, America and Europe. Chinese population

had increased in spite of famines in 1959-61, and this was due to the application of state sponsored medicine and improved personal and public hygiene. Chinese companies have exploited the surplus labour resulting from these changes to create cheap manufactured goods, which they exported to England, America and Europe. This has led to the erosion of manufacturing industries in these countries, resulting in economic inequality and the rise of populism in rustbelt areas.

The conclusions from the work involved in the essays in this book are relevant to a general understanding not only of history, but also our current globalised world. The assumption that sociology is a natural science has provided the basis for all the papers in the book, including challenging the current orthodoxy on population history and its relationship with economic development.

Science flourished in England because of its individualistic culture, reflected in the Royal Society's slogan, "*Without Authority*". Today, sociological science could provide a firm basis for understanding a complicated and changing world, allowing us to formulate policies relevant to the twenty-first century.

Peter Razzell

Chapter 1: The Problem of Determinism: A Sociological Solution.[1]

Contemplating the possibility of determinism, the social philosopher, Isaiah Berlin, wrote:

> ... the changes in the whole of our language, our moral terminology, our attitudes toward one another, our views of history, of society, and of everything else will be too profound to be even adumbrated. The concepts of praise and blame, innocence and guilt and individual responsibility ... are but a small element in the structure, which would collapse or disappear. If social and psychological determinism were established as an accepted truth, our world would be transformed more radically than was the teleological world of the classical and middle ages, by the triumphs of mechanistic principles or those of natural selection. Our words – our modes of speech and thought – would be transformed in literally unimaginable ways; the notions of choice, of responsibility, of freedom, are so deeply embedded in our outlook that our new life, as creatures in a world genuinely lacking in these concepts, can, I should maintain, be conceived by us only with the greatest difficulty.[2]

Although written perhaps with a touch of hyperbole, this quote indicates the seriousness with which some philosophers have viewed the problem of determinism, a concern which has not abated in the last number of years since the above passage was written. The number of publications on the issue has if anything increased, partly due to the growing success of the natural sciences, particularly in the fields of genetics and human biology. However, in spite of the proliferation of writing on the subject, one leading authority – J.O. Urmson – has concluded, that 'no solution to these problems has been

[1] Unpublished paper.
[2] I. Berlin, *Four Essays on Liberty,* 1969, p. 113.

found which commands anything approaching general consent.'[3]

The nub of the problem has been very succinctly summarised by J.R. Lucas in his book, *The Freedom of the Will.*

> We have a profound conviction of freedom. We know we are free. Yet when we think of ourselves from a scientific point of view, we do not see how we can be free. It would be a denial of science, we feel, to make man an exception to the universal laws of nature, and say that although everything else could be explained in terms of cause and effect, men were different, and were mysteriously exempt from the sway of natural laws.[4]

From the vast literature on the subject, and from everyday experience, it does seem that the majority of people do have a sense that both determinism and free-will are true, in spite of what appears to be a fundamental contradiction between them. The aim of this paper is to put forward a sociological resolution to this apparent contradiction. This will necessarily only touch on topics of great complexity, and will cover material from a number of disciplines, without being able to do full justice to any of them. The problem has of course had profound impact on the development of the social sciences, starting with the application of Kant's distinction between the 'laws of freedom' and 'laws of nature' in the nineteenth century. This led to the creation of the two separate disciplines *Geisteswissenschaften* and *Naturwissenschaften,* phenemonological and positivistic sociology respectively. Additionally there have been a number of sociologists who have attempted to integrate these two perspectives, including Max Weber and Talcott Parsons. This proliferation of approaches has generated much controversy.

---

[3] J.O. Urmson and J. Rie (eds.), *The Concise Encyclopaedia of Western Philosophy*, 1989, p. 113.
[4] J.R. Lucas, *The Freedom of the Will,* 1970, p. 1.

Determinism first became an issue in its modern form in the seventeenth century, although even then, Hobbes could write that the problem had already given rise to 'vast and insoluble volumes'.[5] Although it had been discussed in fragmentary form by some of the early Greek philosophers – particularly Epicurus – its first major presentation was in a religious context. A number of early Christian thinkers tried to reconcile the paradox of an omnipotent and omniscient God, who both predetermined the fate of the universe – including that of man – and created at the same time the capacity for free-will.[6] This led to numerous controversies in Christian theology, culminating in a polarisation of doctrine between the Calvinist belief in predestination, and the free-will Arminianism of the Quakers and Universal Baptists.

The success of the natural sciences in astronomy and other areas, led Descartes to adopt a mechanistic view of the material universe, which inevitably raised the question of the application of this mechanical principle to man himself. Descartes' solution to this problem was his well-known dualism, between mind and matter. Mind – or consciousness – was the basis of an 'I' that was capable of acting freely, independently of the laws of nature. The body was seen by Descartes as a part of the material world, raising the issue of the relationship between mind and body – a problem he never successfully resolved. This dualism was rooted in Greek and Christian thinking, and Descartes' 'mind' was the notion of the soul written in new language.

The major difficulty faced by Descartes was how could the non-material substance of mind interact with and influence the material body? Descartes argued that the mind was equivalent to an internal pilot guiding the machinery of the body, operating in the pineal gland, the seat of the mind-body interaction. The unsatisfactory nature of this solution

[5] Quoted in T. Honderich, *The Consequences of Determinism,* 1990, p. 84.
[6] B.A.O. Williams, 'Freedom and the Will', in D.F. Pears (ed.), *Freedom of the Will,* 1963, pp. 5, 6.

was clear even to Descartes himself, but he defined the problem in terms familiar to us today, largely because of his understanding of the principle of causality as applied to the natural sciences.[7]

As a part of this dualism, Descartes postulated a thinking 'I', a self which was the origin and basis of all free action. He was influenced by Aristotle's notion of an 'originating principle of action', capable of generating its own actions. This idea of an 'originator' has been key in all the discussions on free-will and determinism; most defenders of free-will have argued for a human capacity for originating totally free action, and rooted this capacity in a 'self', 'mind', 'person' or other form of individual identity. All these concepts arose historically out of the notion of an individual soul, which was central to both Greek philosophy and Christian theology. The soul was an essential and substantial spiritual self, created by God – and thus lying outside of the realm of nature, with its deterministic laws. In practice, there was a great deal of controversy about the nature of the soul, both in Greek and Christian thinking, a subject which we will return to later.

With the rise of science, it became necessary to substitute secular for religious language. The concepts of the mind and the self replaced that of the soul, although they involved the use of the same basic assumptions: that the self/mind was a simple, unitary essential 'I', capable of initiating free action. This change in language did not resolve the basic contradiction – the mind/body problem – and in fact raised new difficulties by postulating the self as an empirical reality subject to scientific scrutiny. It was Hume who first rigorously examined the concepts of the self and mind from an empirical point of view. From an analysis of mind, he concluded that 'what we call a *mind*, is nothing but a heap or collection of different perceptions, united together by certain

[7] J. Cottingham (ed.), *The Cambridge Companion to Descartes,* 1992.

relations, and supposed though falsely, to be endowed with a perfect simplicity and identity.'[8] Similarly, with the concept of self, he argued that 'when I turn my reflection on *myself,* I never can perceive the *self* without some one or more perceptions, nor can I ever perceive anything but perceptions.'[9] He criticized Descartes for his assumption that the mind was a substance of unitary identity, pointing out that 'everything that exists, is particular: and therefore it must be our several particular perceptions that compose the mind.'[10] A similar conclusion has been reached in our own day by Ryle who has argued that the conventional notion of the mind/self is nothing but the 'ghost in the machine'.[11]

Hume and subsequent thinkers saw that when the mind and self were analysed empirically they dissolved as unitary entities, and became sets of highly complex particular perceptions lacking any observable unity. Hume based his conclusions on subjective introspection, but an objective neurological and biological analysis involves equal difficulties for the concepts of a unitary mind and self. The same conclusion applies to existing sociological and social-psychological analyses of the mind and self; for example, in Mead's work, both mind and self arise out of a process of social interaction, and originate through a pattern of role taking and linguistic communication. The self is seen as being constituted as an 'I', defined as the spontaneous, unique individual, and the 'Me' which is a reflection of the 'Generalized Other', the composite of all social expectations. When Mead's work is examined in detail, it turns out that the 'Me' and 'Generalized Other' are not unitary phenomena, but are concepts reflecting specific roles that individuals enter in to, giving multiple sets of self-definitions.[12] It is for this and

---

[8] D. Hume, *A Treatise of Human Nature* [Book 1], 1962, p. 258.
[9] Ibid, p. 329.
[10] Ibid, p. 349.
[11] G. Ryle, *The Concept of Mind*, 1949, pp. 15, 16.
[12] See G. H. Mead, *Mind, Self and Society,* 1934.

other reasons that contemporary philosophers – even those sympathetic to arguments of indeterminism – have referred to the idea of a self, ego or mind as 'dreadful and bizarre' and 'extravagant'. This scepticism about the self has reached a point where a *Dictionary of Philosophy* has referred to it as 'an obsolescent technical term.'[13]

Hume was aware of the practical difficulties that ensued from this dissolution of the unitary self and mind. He had argued that causality could not be validated through inductive analysis: a perceived regularity could not guarantee the existence of a causal pattern outside acts of perception. His way of dealing with all these problems was his well-known resort to everyday life: 'It is not ... reason, which is the guide of life, but custom.'[14] Elsewhere he appealed to nature as a practical guide: 'Nature has ... doubtless esteemed it an affair of too great importance, to be trusted to our uncertain reasonings and speculations.'[15] Hume himself thus was able to accept the disturbing consequences of his own analysis with some equanimity, but his contemporaries were less happy with his conclusions. In particular, Kant concluded that Hume's work had undermined the philosophical basis of all knowledge, including the foundations of morality and individual freedom.

Kant's reaction to the problems raised by Hume was to resort to the two realms defined by Descartes, but to refashion this duality in a much more subtle and complex way. He postulated a phenomenal world of experience, not unlike Hume's, which was subject to the empirical laws of science and the principles of causality. All that could be observed and experienced was a part of this realm of nature, but in order for knowledge of this realm to be valid, Kant argued that it was necessary to postulate certain *a priori* categories of knowledge which could only be understood through the

[13] A. Flew (ed.), *A Dictionary of Philosophy,* 1979, p. 299.
[14] Hume, *A Treatise*, p. 343.
[15] Ibid, p. 238.

faculty of reason. Reason is the ultimate grounding and source of all continuity in human existence: 'Reason is present in all the actions of men at all times and under all circumstances, and is always the same.'[16] It was through reason that man could find a point of fixture, a principle invoked as a bastion against the flux of experience that Hume had discovered in his philosophy. Almost as important for Kant was the *a priori* category of freedom, that lay at the core of his moral ideas. All these categories were of a transcendental nature, and could not be derived from experience or empirical evidence. It was impossible according to Kant to know anything about the metaphysical content of these transcendental categories, as they could only be apprehended by rational understanding and not through empirical experience. The ultimate basis for all the categories was *practical necessity*: without them, it was impossible to establish a philosophical basis for either knowledge or moral freedom.[17]

Kant had succeeded in removing some of the more obvious difficulties in Descartes' dualism, but at the cost of transferring the ultimate realities – noumenal self, reason and freedom ('things-in-themselves') – to the empty realm of the transcendental. Although Kant's solution was radically different to Hume's, they both shared an appeal to practical necessity as a final resting point, although for Kant it was a formal part of his philosophy, whereas for Hume it was a form of almost perplexed resignation. Kant's postulate of the two realms of 'nature' and 'freedom' was associated with appropriate forms of causation – natural necessity and the causality of freedom. All empirical human acts were subject to the laws of nature, and according to Kant there were no exceptions to this rule. All acts could however be viewed from both standpoints, so that an act was both naturally caused, while at the same time originating from a free choice

[16] I. Kant, *Critique of Pure Reason*, 1933, p. 478.
[17] Ibid, p. 343; I. Kant, *Critique of Practical Reason*, 1956, pp. 5, 6.

of the noumenal self.[18] The former was empirically observable, but the latter could only be abstractly postulated through transcendental reason.

Kant's solution to the problem of determinism – the creation of two realms – was unsatisfactory on a number of accounts. Firstly, it was a transcendental solution, and therefore had an obscure, remote quality. Secondly, and most importantly, the noumenal self which was the originating source of freedom, was a non-empirical postulate, and therefore subject to the same objection as Descartes' original formulation. Kant had initially seen the self as 'a spiritual, enduring, incorruptible being'[19] – the soul – but later in his philosophy was content to postulate it merely as a transcendental category. Kant defined the soul as having the following qualities: '1. The soul is substance. 2. As regards its quality it is *simple.* 3. As regards the different times in which it exists, it is numerically identical, that is, *unity* (not plurality). 4. It is in relation to *possible* objects in space.'[20] The fourth point was necessary to deal with the problem of the soul interacting with the empirical world of nature, but it was in effect self-contradictory: Kant had defined the noumenal soul as being outside space and time, so how was it possible for it to influence the material world of nature? Kant's retreat into the transcendental postulate does not in any way solve this problem, and the formulation has failed to satisfy most philosophers. However, I will be arguing later, using sociological arguments, that it is possible to restate Kant's thesis in a much more acceptable and valid form.

* * * * * * * * *

Most philosophers writing on determinism have recognized that it is not a theory which can be proved true or false, but

[18] Kant, *Critique of Practical Reason*, pp. 464, 467.
[19] K. Ward, *The Development of Kant's View of Ethics,* 1972, p. 72.
[20] Kant, *Critique of Pure Reason*, pp. 330. 331.

rather is a set of heuristic assumptions making possible the practice of science, at least in its classical form. It is impossible to falsify its premises, as any falsification of a particular hypothesis or theory, leads to further attempts to give causal explanations of the phenomenon in question. It is the source of the fruitfulness of science, that it never abandons its quest for explanation on the grounds of a particular failure. It is the basis of its aggressiveness, laying claim to all areas of experience, and given the hypothetical nature of scientific truth, it is unlikely to ever lose this dynamic quality, at least in the foreseeable future.

The reason why determinism has been taken so seriously is not because its major thesis has been proved to be true, but rather because of its successes in the natural sciences. In particular, the spectacular results in research in genetics and human biology in the last thirty or forty years, has given rise to the unease expressed by Berlin and quoted at the beginning of the paper. The explanations given by biology and genetics are in classical causal form, e.g. some of the recent work on genetic diseases such as muscular dystrophy, specifically defining muscular degeneration as an effect of a particular defective gene. In sociological terms, deterministic assumptions can be said to be a 'functional pre-requisite' for the practice of classical science, a pre-requisite which is in the form of fundamental premises rather than testable hypotheses.

The major difficulty with this line of argument is the emergence of quantum mechanics in twentieth century physics. This is subject of much controversy and obscurity, so that Feynman, one of the leading contributors to the development of relativistic quantum field theory, could write, 'nobody really understands quantum field theory'.[21] Physicists have been unable to agree amongst themselves whether or not quantum mechanics is fundamentally indeterminist, as Bohr and Heisenberg, two of the authors of the Copenhagen

[21] Quoted in E. Squires, *The Mystery of the Quantum World,* 1986, p. 122.

Statement, argued, or whether as Einstein believed 'God does not play dice with the universe'. The dispute continues unabated, and a number of physicists have continued to search for 'hidden variables' in order to give a complete deterministic account of quantum mechanics. It is clearly beyond the competence of an outsider to comment on what is such highly specialized and difficult work.

However, a number of scholars have pointed out that the problems of interpreting the behaviour of sub-atomic phenomena do not appear to apply to the macroscopic level of reality.[22] And this is ironically confirmed by Heisenberg: in describing the death of a physicist colleague, he stated that 'I cannot doubt but that the beginning of his illness coincided with those unhappy days in which he lost hope in the speedy completion of our theory of elementary particles. I do not, of course, presume to judge which was the cause and which the effect.'[23] So in practice, Heisenberg was forced to resort to deterministic language when talking about his own experience. As indicated by Hume, we assume the principle of determinism applies to our everyday lives, particularly in its physical aspect. And it is for this reason that the problem of determinism will not go away, in spite of the emergence of quantum mechanics in contemporary physics.

The success of biology and neurology as disciplines in recent decades has led to a great deal of discussion of the mind/body problem, focussing on the brain and its relationship to consciousness. This has become a matter of some controversy, but it is universally agreed that there is a very close relationship between brain and mental activity. The most coherent and consistent explanation of this relationship is that known as identity theory. There are a number of variants, but I will confine myself to a discussion of the form which I believe can lay the foundations for a solution to the mind/body problem. The starting point is Frege's doctrine that

[22] See for example T. Honderich, *Mind and Brain,* 1990, p. 105.
[23] W. Heisenberg, *Physics and Beyond,* 1971, p. 236.

certain terms of language have both reference and sense. The most familiar example is the relationship between the Morning Star and the Evening Star; they are in fact the same star (having the same reference) but because they are perceived at different times (morning and evening), they have a different sense. In other words, the same phenomenon is described in a different language because it was viewed from different perspectives, the identity of the two stars not being realized when the two separate names were coined.

Similarly, it is argued by identity theorists that brain processes and consciousness are identical, the one being viewed from the outside, the other from inside. Consciousness is the process of the brain – it is merely that which is experienced from the inside. The term coined by the analytical behaviourists – privileged access – is germane to this formulation; the person in question has a privileged access to the private experience of consciousness because it can only be experienced from the inside. From the outside, this experience will be described in neurological and biological terms, and so we have the language of the subject·(inner consciousness) and that of the objective observer (neurology and biology) – both referring to the same, identical phenomena.[24]

This deceptively simple formula raises a host of problems, but I believe all these can be solved through careful analysis. Firstly, the most simple types of identity – for example pain – can clearly be seen to refer to the same phenomena. A toothache arising from caries caused through bacteriological infection and transmitting information to the brain (biology and neurology) is subjectively experienced as pain (consciousness). The first is an objective explanation in causal language, made by the outside observer; the second is a subjective account of consciousness made by the person undergoing the biological experience from the inside – and of

[24] See E. Wilson, *The Mental as Physical*, 1979 and D.M. Armstrong, *A Materialist Theory of Mind*, 1968.

course, they refer to the identical phenomena. Similarly with hunger and sexual desire (subjective experiences) – they are identical to certain physiological and neurological states which can be defined objectively and scientifically. Acts of cognition likewise can be readily analysed in this way; for example, a person opening his eyes from sleep and seeing an object (a picture) – this can be described either as: 1. an act of consciousness or 2. a physiological movement of the eyes and the activation of certain brain processes. (Patterns of sleep, dreaming etc have been analysed through encephalograph measurements.) Both these descriptions refer to an identical event, merely using different language, depending on perspective.

These examples do not pose major problems for identity theory, but there is more difficulty with subjective phenomena such as intentions, purposes and facts of choice. Identity theory works well with obvious physical events, but becomes more difficult to accept with subtle and complex phenomena of a less obviously physical nature. There are two reasons for this: 1. The difficulty of locating the phenomena in question or, 2. The problem of giving any kind of coherent explanation of them. Although it is not possible to precisely locate a subjectively described phenomenon such as (say) an intention, it is clear that it must be located in principle in the brain, even it is not possible (at least not on current knowledge) to identify it with a specific neurological process. Empirically, we can address this point by asking, if not in the brain, where else would it be located? And we may add from a scientific point of view, if it is located in the brain, it must necessarily be a physical phenomenon.

The second point is more serious. One of the major criticisms of identity theory is that it does not do justice to 'the indispensability of the mental'.[25] It is unclear exactly what this phrase refers to – possibly the sheer subjective

[25] Honderich, *Mind and Brain*, p. 105.

conviction of consciousness and mental experience. This itself is no objection to identity theory, but it does contain an implication which is valid. 'The indispensability of the mental' implies a Cartesian insistence on consciousness as the basis of knowledge and individual identity, with the tacit assumption that it is the foundation of a self capable of moral choice. Most accounts of identity theory, are unable to give a coherent explanation of what we might call the moral dimension of experience, so that for example, one of the most persuasive recent expositions of the theory, virtually eliminates moral choices and intentions from its analysis.[26] We are thus returned to the central dilemma of this paper: how can a deterministic account of human behaviour – such as identity theory – be reconciled with notions of free-will?

The answer is contained within identity theory itself. There are two ways of describing events: one in the language of the subject, the other in the language of the objective observer. This has most eloquently been summarized by J.R. Lucas:

> Free-will belongs to the agent's language, determinism to the spectator's. I, as an agent, perform some actions freely: he, as a spectator, may predict events correctly. But I am not he; to be an active participator is not the same as to be an observer from the sidelines, and actions and events are logically very different; and therefore ... no conflict can arise between my belief as an agent that I am acting freely and his certainty, as a spectator, that events will follow their pre-established course; since the key concepts of the opposition must be formulated in different languages, no contradiction between them can arise.[27]

Lucas was writing from the perspective of analytical philosophy, with its emphasis on 'linguistic games', and the function of language regarding the activities of separate

---

[26] Wilson, *The Mental.*
[27] Lucas, *The Freedom*, p. 17.

linguistic communities. Kant's distinction between the phenomenal and noumenal self is very similar, referring to the separate realms of natural necessity and freedom. None of these accounts give a satisfactory explanation of the existence of these separate modes of experience, but they all agree that they are based on *practical necessity.* For Hume it was the inevitability of nature and communal living; for Kant it was the necessity of practical reason; and for Wittgenstein and his followers, it was the functions of language for social life. Kant had summarized his philosophy when he wrote: 'Two things fill the mind with ever new and increasing admiration and awe ... the starry heavens above me and the moral law within me.'[28] This way of viewing the problem points us in the direction of a correct solution to the problem of determinism: the existence of two separate *social roles* – that of the *objective observer* and that of the *moral self.*

* * * * * * * *

There are innumerable and conflicting definitions of social role in the literature, but it can be defined as a set of normative expectations (obligations and rights) structured around a particular social position. In modern society, it is virtually impossible to escape the tensions which arise out of the above two role perspectives. This is not only because of the ubiquity of activities influenced by the natural sciences, but also because of the growth of bureaucratic and legal procedures which give rise to a rationalizing perspective linked with the objective attitude. In law it is now common to appeal to deterministic criteria in mitigating the consequences of criminal behaviour; the law is of course the main area in which the notion of personal responsibility is activated, but appeals to mitigating medical and psychological handicaps have become increasingly common in the last few decades. The debate about capital

[28] Kant, *Critique of Practical Reason*, Conclusion.

punishment illustrates this theme: those who view it as a deterrent see it in term of objective consequences, whereas those demanding revenge and punishment are adopting the moral and subjective perspective. In legal situations, whether to define behaviour morally or medically is largely a question of choosing the language and assumptions of the two role attitudes. There is no intrinsic or technical criteria for making this choice, it must by the very different nature of the two perspectives, be a matter determined by other criteria: sympathy, social position, power and the ability to manipulate others to give favourable definitions.

The attitudes and behaviour in the two role situations will be fundamentally different: in one sense, we can say that the person fulfilling these two roles will feel him or herself to be a different person in the two situations. The two roles will elicit distinctive perceptions, emotions and physical responses, and if required to describe role behaviour, will generate different languages.

Of course, there are many considerations other than role behaviour in these situations, and in any one instance there will inevitably be a mixture of role responses. Social roles are clusters of ideal, normative expectations, which in practice are hardly ever enacted in pure form. There are innumerable other variables which determine any one type of behaviour, but for our purposes, it is sufficient to note that the distinction between objective observer and moral self is both logically valid and empirically fruitful. The role of the moral self is however more significant than that of objective observer, and is the most fundamental role in human society, with universal applicability. We are here dealing with matters of great complexity, and it will only be possible to touch on the most significant features of the moral self.

One complication in the analysis of the objective observer and the moral self roles is the prevalence of magical thinking in the earliest stages of human cultural evolution, which inhibited objective realism as well as complicated the

analysis of the moral self. For example, James Morrill, who spent thirteen years living with the aborigines of Queensland in the middle part of the nineteenth century, described some of their beliefs as follows

> The moon *(werboonburra*), they say is a human being, like themselves, and comes down on the earth, and they sometimes meet it in some of their fishing excursions. They say one tribe throws it up and it gradually rises and then comes down again, when another tribe catches it to save it from hurting itself ... They think the falling stars indicate the direction of danger, and that comets are the ghosts or spirits of some of their tribe, who have been killed at a distance from them, working their way back again ... They think all the heavenly bodies are under their control; and that when there is an eclipse, some of their tribe hide it [the sun] with a sheet of bark to frighten the rest ... But they are very uneasy during its continuance. They pick up a piece of grass and bite it, making a mumbling noise, keeping their eyes steadily fixed on it till it passes over, when they become easy again and can go to sleep comfortably. They think they have power over the rain *(durgun*) to make it come and go as they like.[29]

There is no doubt that magic was ubiquitous in tribal societies, although a number of anthropologists have pointed out that a belief in magic was limited by the existence of economic technology, which ensured a degree of objectivity. However, the existence of magic affected both the practice of objective realism and the attribution of personal responsibility. We are told of the Australian aborigines that 'they do not suppose that any one dies from natural causes, but [always] from human agencies', with a number of examples given of individuals punished and killed on account of the alleged use of magic.[30] Additionally, magic was frequently used as a mode of punishment or retaliation. If as Levy-Bruhl and

---

[29] J. Morrill, *Sketch of a Residence Among the Aboriginals of Northern Australia,* 1864, pp. 19, 20.

[30] B. Malinowski, *Magic, Science and Religion,* 1948.

others have argued, the ubiquity of magic eclipsed the distinction between individual self and a universal, spiritual and mystical reality, personal responsibility would be impossible. In practice, all tribal peoples do make such distinctions, so that for example, as Evans-Pritchard tells us of the Azande, 'if you tell a lie, or commit adultery or steal ... you cannot elude punishment by saying that you were bewitched.'[31] Tribal peoples do universally ascribe spiritual qualities to the self, but it is the necessity of individual responsibility which limits the extent of magical belief, and, along with technology, is responsible for the beginnings of objective realism.

However, some anthropologists – in particular Levy-Bruhl – have argued that no distinction was made in tribal societies between the individual self and other subjectively defined realities, and an authority of the stature of Marcel Mauss, has concluded that a full sense of the individual self only arose in the modern period. This is a matter of some controversy, and Mauss, who was very familiar with the anthropological evidence, qualified this conclusion by writing that

> In no way do I maintain that there has ever been a tribe, a language, in which the term 'I', 'me' *(je, moi)* ... has never existed, or that it has not expressed *something* clearly represented ... it is plain, particularly to us, that there has never existed a human being who has not been aware, not only of his body, but also at the same time of his individuality, both spiritual and physical.[32]

Steven Lukes has pointed out, if we leave aside more arcane theoretical considerations, there is a parallel in 'everyday

---

[31] E.E. Evans-Pritchard, *Witchcraft, Oracles and Magic among the Azande*, 1937, p. 74.

[32] M. Mauss, 'A category of the human mind: the notion of the person, the notion of the self', in Michael Carrithers et.al. (eds.), *The Category of the Person,* 1985, p. 3.

conceptions of the person', in our own culture and those ranging from classical China through to tribal Africa.[33] The notion of an individual self is universal, and is as important and significant in tribal societies, as it is elsewhere. Reactions to death of a particular individual indicate that people in tribal societies display as much, if not more, grief than do modern Europeans. However, many tribal societies appear to confer less status on very young children and to some extent the very elderly, and therefore less importance is attached to loss of life in these categories than with other persons.

The pervasiveness and ubiquity of the concept of self requires special explanation. Our starting point must be the analysis of practical necessity, or to use a sociological term, functionality. Functionalism has been criticized because of the teleological nature of much of its argument, as well as its conservative ideological bias. It is however possible to restate to the tenets of classical functionalism so as to overcome these objections. The seeds of this restatement are to be found in a passage by one of the founders of modern functionalism, Wilbert E. Moore:

> The explicit introduction of system survival as a test of necessary consequences of human action and the structural mechanisms for producing those results perforce appealed to an evolutionary perspective. The argument must essentially be that various behaviours appear in human aggregates, some of which support or improve the viability of those aggregates and others that do not. Through natural selection those that contribute to system operation survive, and others are rejected. The same argument can be made for whole societies, whether in competition with other societies or simply coping with the challenges of the nonhuman environment. In the early explicit formulations of what came to be called 'functional requisite analysis' this evolutionary assumption was not articulated.[34]

---

[33] S. Lukes 'Conclusion', in Carrithers, *The Category*, p. 297.

[34] W.E. Moore, 'Functionalism', in T. Bottomore and R. Nisbet (eds.), *A History of Sociological Analys*is, 1978, p. 342.

This formulation of functionalism places it squarely in the Darwinian tradition, removing its teleological aspect, and allowing for objective causal analysis. Socially structured behaviour is seen as analogous to a biological structure; its existence is explained through natural selection, so that only those behaviours which enable social systems – and their individual members – to survive, will be selected. This process of selection is independent of human intention or meaning, although obviously human beings can rationally assess the probability of a particular mode of action ensuring their survival. The latter is associated with the role of the objective observer, which also ensures the survival of both individuals and societies. But much human social behaviour will not fall within this rational category, and this will include aspects of the role of the moral self. Given the non-rationality of much of the behaviour associated with this role, its universality must be explained in terms of its capacity to meet certain fundamental functional pre-requisites.

This approach can be linked with the revival of interest in cultural evolution, as well as the more recent development by Popper and others of evolutionary epistemology. Popper and Eccles have touched on the evolution of consciousness and the self as follows:

> What is usually described as the unity of the self, or the unity of conscious experience, is most likely a partial consequence of biological individuation – of the evolution of organisms with inbuilt instincts for the survival of the individual organism. It seems that consciousness, and even reason, have evolved very largely owing to their survival value for the individual organism. ... The activity of the self, or the consciousness of self leads us to the question of what it does; of what function it performs, and so to a biological approach to the self.[35]

[35] K. Popper and J. Eccles, *The Self and Its Brain*, 1977, pp. 108, 114.

Popper and Eccles are undoubtedly correct in emphasizing the biological basis of the self, and it is the physical separateness of individuals which forms the primary condition for an individual self. It is this biological fact which makes individuals crucial for all social structures and their functioning; the individual necessarily is the focus of all social action, and it is this fact which lays the foundation for the universality of the individual self. Popper has quite correctly pointed out the need to look at the functions of the self to fully understand the phenomenon, but his biological emphasis only provides an initial statement of the problem, and what is required to complete the analysis is a sociological perspective.

* * * * * * * *

The reference to the unity of the self must be our starting point. All the concepts that have been discussed in this regard – self, soul, ego, personal identity – are essentially the same phenomenon. It is only with such a category and social role, that continuity and consistency in thinking is possible, and this forms the basis of 'a thinking, willing I ... an essence that 'posits' its own acts, 'generates' and possesses psychic realities as its very own and is responsible for them ... the abiding and supporting principle of all ... conscious life.'[36] The fundamental function of such a unified self is that it enables individuals to be held responsible for their actions, and thus forms the basis of all moral and social action. A self which can be held responsible for its actions constitutes the indispensible functional pre-requisite for all normative and social behaviour, and without meeting this pre-requisite, it would be impossible for any group or social system to survive. It is thus for this reason that the concept of a private self or soul is found in all societies, for without this concept

[36] W. Brugger, K. Baker, *Philosophical Dictionary,* 1976, p. 381.

and primary social role, no society could continue to exist. The moral self is a social role which creates the coherent and organized set of attitudes which constitutes individual identity, the ego and the self. The major obligation attached to the role is the personal responsibility which underpins all normatively regulated social life; the major right, is the capacity for personal freedom. In order to be held personally responsible, it is necessary to have the freedom to enact that responsibility.

The anthropologist, Paul Radin, has perhaps most clearly recognized the importance of personal responsibility and freedom in tribal societies:

> Now the concept of *person* in aboriginal society involves a number of definite things. This is not due to any mystical or philosophical interest on the natives' part, but flows from the purely practical consideration that they wish to know with whom they are dealing and the nature of the person's responsibility. In civilizations where a belief in reincarnation, ancestor-identification, transformation, multiple souls, etc., is involved in the concept of personality, the nature of an individual's responsibility for a given act is of paramount importance.[37]

This tacitly concludes that language used is secondary to the social reality; the assumption of individual responsibility exists even where it is not articulated explicitly.

According to Radin, although it is social groups who have formal legal responsibility in tribal society, it is individuals who in practice are held responsible, particularly for those most highly personal of activities, murder and marriage.[38] These are the most dramatic examples, but in fact, the concept of personal responsibility is ubiquitous, as without it, even minor forms of social life would be impossible. This can be illustrated through Colin Turnball's study of the Mbuti

[37] P. Radin, *The World of Primitive Man*, 1953, p. 114.
[38] Ibid, p. 290.

pygmies. Turnball describes an incident in camp late one evening:

> Moke, very quietly, and talking as if only to the hunters but never lowering his arm or taking his eyes off Asuk, said, 'That is a completely bad man. I have been watching and I have seen with my eyes, and my spirit (*roho*) makes me speak. He makes noise all the time, and he is the cause of all the noise in the camp. I would like to throw him out forever.'[39]

Although responsibility is individual, the quality and context of it is different in tribal societies to what it is in modern European societies. Radin tells us

> That there is a 'spiritual' side to a wrongdoer's state of mind is obvious but no feeling of sin, in the Hebrew-Christian meaning of the term, is present. All that is demanded is the realisation that an individual has offended against the harmony of communal life. His punishment means the harmony has been re-established ... Human beings can disport themselves as they will. If they are ridiculous, they will be laughed at; if they commit crimes, they will be punished and then, if they wish, they may commit some more.[40]

This should not be read to imply that there is a lack of internalisation of moral codes amongst tribal peoples. Radin specifically tells us while discussing a myth, in which a man kills his wife and child during a period of famine, that 'he judges and punishes himself. It must be so if society is to persist.'[41] Individual responsibility is found in all societies, it is its quality and context which differs: tribal societies emphasize social harmony to a much greater degree than do contemporary European ones. Radin probably over-estimates the degree of individual responsibility in such societies; even in marriage and murder where he believes it to have been

---

[39] C. Turnball, *The Forest People,* 1961.
[40] Radin, *The World*, pp. 249, 257.
[41] Ibid, p. 330.

particularly strong, it was often the family or wider social unit which took responsibility, and certain categories of individual – for example women – lacked the power and personal independence necessary for the exercise of full responsibility. However, Radin is probably correct in his conclusion that all individuals, with full adult status, were held responsible for their actions in the last resort.

This transition from the status of childhood to that of adulthood is universal, and is linked to becoming a responsible subject:

> Full status was conferred on an individual at puberty and we all know the elaborateness of these rites and their ubiquity. A person was then truly functioning sociologically. He was responsible for his actions; he had to face life independently, and he could marry and raise children.[42]

To hold someone responsible for their actions implies that the person in question is capable of independent action. It has been generally recognized that this form of voluntary action must entail an absence of physical constraint, and also an assumption of personal causality. The term causality is not used here in the classical mechanical sense, but rather with the primary meaning given to it by Aristotle: an attribution of motivation to independent agents. Nevertheless, we can say historically, the assumption of personal causality laid the foundation for the eventual development of objective realism, with its complete separation of subject and object.

This separation was only fully achieved with the development of modern science, which was a part of that process of rationalization which eclipsed magical thinking, at least in the mainstream of European culture. This has led to a crystallisation of the modern self, with the virtual elimination of the projected subjectivity which was involved in animism and magic. But this in no way diminishes the underlying

[42] Ibid, p. 80.

continuity of the moral self found throughout human history, based on the necessity of individual responsibility. Perhaps the greatest difference between the tribal and modern self is the extension of the category of personhood to very young children. In some tribal societies, young children are not considered full persons, and are sometimes killed during periods of great scarcity, through infanticide and other practices. This is consistent with our definition of a person in terms of responsibility, which in turn is linked to a capacity for practical action in economic and other spheres. The extension of personhood to young children is itself a sociological phenomenon, but that takes us away from our main concern, which is the analysis of the role of the moral self and its relationship to determinism.

* * * * * * * *

In 1962, Peter Strawson wrote, 'Freedom and Resentment', a paper which initiated the modern debate about the problem of determinism. It is impossible to do justice to the complexity and subtlety of Strawson's argument with a brief summary, but an indication of its central theme is given in the following quotation:

> What I want to contrast is the attitude (or range of attitudes) of involvement or participation in a human relationship, on the one hand, and what might be called the objective attitude (or range of attitudes) to another human being, on the other. Even in the same situation, I must add, they are not altogether *exclusive* of each other; but they are profoundly opposed to *each other.* To adopt the objective attitude to another human being is to see him, perhaps, as an object of social policy; as a subject for what, in a wide range of sense, might be called treatment; as something certainly to be taken account, perhaps precautionary account, of; to be managed or handled or cured or trained ... The objective attitude ... may include repulsion or fear; it may include pity or even love. But it cannot include the range of reactive feelings and attitudes which belong to involvement or

> participation with others in inter-personal human relationships; it cannot include resentment, gratitude, forgiveness, anger, or the sort of love which two adults can sometimes be said to feel reciprocally, for each other.[43]

Strawson's contrast between the objective and participating attitudes is very similar to the distinction between the roles of objective observer and the moral self, except that Strawson emphasizes intentionality rather than personal responsibility, and he is not interested in a formal analysis of the two sets of attitudes. For Strawson, individuals can engage in emotionally reactive relationships because of their capacity to express intended and meaningful behaviour as free agents. To adopt the objective attitude towards a person is to remove their capacity to be fully human, to depersonalize them, and to reduce them to the status of objects. Strawson recognises that adoption of this objective attitude can allow the suspension of normal moral responses which might have humane consequences depending on the situation, but his main interest is the indispensability of the reactive attitude for the continuation of human relationships.

This analysis of the objective attitude has led to what Honderich has termed dismay at the consequences of determinism.[44] Honderich has extended Strawson's analysis to include the 'life hopes, personal feelings, knowledge, moral responsibility, actions and principles, and the general moral standing of agents.'[45] It is beyond the scope of this paper to discuss these themes, but it sufficient to note that all these problems, like those outlined by Berlin earlier, stem from a belief that determinism undermines the possibility of free, independent action. Only the existence of a self acting as an ultimate 'originator', without the interference of the mechanical effects of determinism, can guarantee the individual freedom which will

---

[43] P.F. Strawson, 'Freedom and Resentment' in Gary Watson (ed.), *Free Will,* 1982, p. 66.
[44] Honderich, *Mind.*
[45] Ibid, p.3.

not result in dismay. Anything else will reduce man to the status of a depersonalized object, incapable of genuine humanity. Honderich has attempted to solve this problem by postulating the possibility of self-affirmation, but this very solution requires the assumption of a self which is at the very centre of the problem itself.

The solution to the problem is contained in the recognition that the moral self is a social role that is totally distinct from that of the objective observer. Although both these social roles are subject to deterministic analysis – as are all forms of empirical reality when viewed from the perspective of the objective observer – the roles themselves generate entirely different modes of experience.

It might be argued that from the point of view of the objective observer the postulate of a moral self is an illusion, because it assumes a freedom of action which conflicts with the assumptions of determinism. And it is the scrutiny of the role of the moral self from the viewpoint of the objective observer that has given rise to the problem of dismay, outlined by Honderich and others. But the problem only arises through role confusion: from the viewpoint of the moral self, freedom is not an illusion – it is an indispensible necessity of personal and social life. In our roles as moral selves, determinism is irrelevant, and as reality is shaped largely by our role experiences, it is with the acceptance of this reality that the problem of dismay disappears. This has some similarity with Hume's acceptance of the reality of everyday life, except the dimension of role analysis allows us to understand much more clearly and profoundly the nature of this solution, and in certain respects it is closer to Kant's postulate or two realms than Hume's voluntaristic position.

In practice, role confusion is not just a personal matter, but is also sociologically determined. The role of objective observer has become much more prominent in our society through the growth of science, technology and medicine, and this almost inevitably has led to role conflict. In contemporary psychiatry, the mainstream theoretical perspective is

deterministic, both in the biological/behavioural schools, and psychoanalytical/psychodynamic ones. The language used is that of the objective observer, but inevitably the terminology of the moral self is introduced because of the nature of the disciplines. Strawson observed this when noting

> ... the strain in the attitude of a psychoanalyst to his patient. His objectivity of attitude, his suspension of ordinary moral reactive attitudes, is profoundly modified by the fact that the aim of the enterprise is to make such suspension unnecessary or less necessary. Here we may and do naturally speak of restoring the agent's freedom.[46]

The aim of the psychoanalyst is to restore the capacity of the patient to become an independent person, to cease being a clinical object, but to become a full subject, capable of free and responsible action. This illustrates that most psychiatric disciplines use the concepts and assumptions of both role models in their work, but this is not inevitable. Behavioural therapy tends to deny the subjectivity of the patient, and sees its work in purely objective, physiological terms,[47] whereas existentialist therapy almost exclusively emphasizes the freedom of the subject. In this sense, existentialist therapy is a contradiction in terms, as in its pure form, it refuses to acknowledge terms such as mental illness, patient cure and the concept of therapy itself.[48] Definitions will of course vary depending on which role model is adopted, so that for example during the First World War, soldiers who refused to stay and fight in the trenches were either classified as malingerers and therefore punished, or defined as suffering from shell-shock and given medical treatment. The first treated the individual as a moral self, the second viewed him as a clinical object.

---

[46] Strawson, *'Freedom',* p. 75.
[47] B.F. Skinner, *Beyond Freedom and Dignity,* 1971.
[48] T. Szasz, *The Myth of Mental* Illness, 1962.

From the army's point of view – leaving aside ethical considerations – there is the practical question as to which role definition was most effective in getting soldiers to return back to the trenches. Likewise we can ask whether psychoanalysis or the existentialist attitude – or a combination of both – is more effective in bringing about personal independence. The psychoanalyst will classically take the former role and concentrate on the causally determined sequence of events which take place in childhood; the existentialist will adopt the position of the moral self, and emphasize freedom and personal responsibility. In practice, the effectiveness of the different role definitions will depend on a number of factors, including the expectations of patients and persons concerned.

It has become a commonplace to see bureaucracy as a source of the type of alienation that can be associated with the objective attitude. The dominance of bureaucracy and the devaluation ·of individual responsibility, may have been one of the factors in the collapse of Soviet Communism – all systems need to attribute personal responsibility to function effectively.

Kafka's description of the bureaucratic nightmare is reminiscent of Heidigger's notion of 'unauthenticity' – a depersonalized and objectivised mode of being – a concept not all that different from Marx's alienation and Weber's 'disenchantment of the world'. The existentialists have given some of the most persuasive descriptions ·of personal alienation, and to quote Galen Strawson on Camus, 'When *l'etranger* alludes to one of his desires, it is half as if he were recounting a fact about a feature of the world which is extraneous to him – a spectator to his own actions.'[49] For existentialists the immediate resolution of this type of alienation is the restoration of the potency associated with a full acceptance of personal responsibility and the freedom of the moral self.

Sociological factors are of course crucial in both determining patterns of alienation and the conditions necessary

[49] G. Strawson, *Freedom and Belief*, 1986, p. 234.

for their resolution. A capacity for freedom is inextricably linked with the structure of power in any society which in turn is shaped by its economic and social conditions. For example, in order for women to be full and free subjects, they not only have to achieve equal status with men, but also have to acquire the freedom which comes with the abolition of economic scarcity and political oppression. The same would apply to slaves, lower castes and all oppressed groups.

Power is a critical dimension in the overcoming of this form of alienation, as power is intrinsically linked with the capacity for self-determination and the independence necessary for full personal responsibility and individual freedom. Ultimately the freedom of any one individual is linked with the freedom of all, but this is to raise a theme beyond the scope of the present paper. However it is appropriate to end with a positive conclusion: the distinction between the objective observer and the moral self resolves the problem of determinism, and in doing so, provides a clear intellectual foundation for the existence and practice of individual responsibility and freedom, along with the personal self-affirmation which flows from it.

Chapter 2: The Protestant Ethic and the Spirit of Capitalism: a Natural Scientific Critique.[50]

Max Weber's *The Protestant Ethic and the Spirit of Capitalism* is widely recognised as one of the most outstanding contributions made by a sociologist to the understanding of the origins and development of modern capitalist society. Yet Weber himself felt towards the end of his life that his thesis had been fundamentally misunderstood. Critics such as Sombart and Brentano had mistakenly assumed that he was concerned with the impact of religious ethical teaching on the development of practical economic conduct:

> We are interested rather in something entirely different: the influence of those psychological sanctions which, originating in religious belief and the practice of religion, gave a direction to practical conduct and held the individual to it … This is, to speak frankly, the point of the whole essay, which I had not expected to find so completely overlooked.[51]

Since Weber's death the same kind of fundamental misinterpretation has repeatedly recurred: for example, two of the most important historians to comment on his work – R.H. Tawney and Kurt Samuelsson – have both assumed that it primarily concerned the ethical doctrines preached by the leaders of the Reformation,[52] rather than the psychological effects of

---

[50] First published in the *British Journal of Sociology,* Volume 28, Issue Number 1, 1977.

[51] M. Weber, The Protestant Ethic and the Spirit of C*apitalism*, 1930, pp. 97, 197, 217, fn 3. Weber also felt he had been misrepresented on the role of ethical doctrines on usury – this had not been a part of his main argument and has been a further source of misunderstanding of his work. See Ibid, pp. 200. 201.

[52] R.H. Tawney, 'Forward' to Weber, *The Protestant Ethic*; K. Samuelsson, *Religion and Economic Action*, 1957.

theological ideas propounded by them.[53] Much of this misunderstanding of Weber's thesis is due to its notoriously fragmented nature: not only did he develop it in a number of sociological works other than *The Protestant Ethic* but he made some of his most important analytical statements in the rather obscure footnotes that he later attached to this work. In some respects virtually all of his writings can be seen as relevant to the thesis, which appears to have reflected certain central personal preoccupations.[54]

The major aim of this paper is to clarify the basic nature of Weber's substantive argument, and to critically evaluate its logical validity. In order to understand this basic argument, it is necessary to examine the methodological assumptions which form a concealed but important part of his analysis. The central methodological viewpoint of this paper is diametrically opposed to that adopted by Weber: whereas he rejected sociology as a natural science in favour of a definition of it as a historical cultural discipline dealing at the explanatory level in subjective meanings and values, the present work assumes that sociology is a natural science which treats social actions and behaviour as objects to be explained in a deterministic and causal manner. Weber objected to explanations made in the form of uniform or universal generalisations and was particularly averse to the application of evolutionary concepts of the kind employed in biology.

I will argue that Weber's methodology was incapable of explaining the results of his substantive work on the protestant

---

[53] Weber wrote that *The Protestant Ethic* thesis was 'a contribution to the understanding of the manner in which ideas become effective forces in history.' Weber, *The Protestant Ethic*, p. 90. Weber summarised his position about the role of ideas as follows: 'Not ideas, but material and ideal interests, directly govern men's conduct. Yet very frequently the 'world images' that have been created by 'ideas' have, like switchmen, determined the tracks along which action has pushed by the dynamic of interest.' H.H. Gerth and C. Wright Mills, *From Max Weber*, 1948, p. 280.

[54] See A. Mitzman, *The Iron Cage: An Historical Interpretation of Max Weber*, 1970.

ethic thesis, and that he was forced by the logic of his own analysis to continually resort to the evolutionary concept of rationalization. Weber's thesis, however, leads into complex areas beyond an evolutionary perspective, the most important being the psychological consequences of the process of rationalization (anxiety and guilt resulting from disenchantment). Again, it is argued that only a natural scientific, psychological, perspective can adequately account for the results of his substantive work. However, no amount of further analysis of the concepts of rationalization and disenchantment can solve the problem posed at the beginning of the protestant ethic thesis: Why did the process of rationalization occur in so many different spheres of social life in the occidental world, and not elsewhere? No attempt will be made to discuss this question in this paper, except where it has a bearing on the mode of Weber's own analysis.

The above summary can only give the most important outlines of the arguments involved, and to fully understand the issues arising out of Weber's work it is necessary to carefully consider a wide range of his methodological and substantive writings. Weber can be classified as a neo-Kantian with respect to his most fundamental methodological assumptions. Kant's distinction between the realm of 'physical nature' and the realm of 'individual freedom' is reflected in the following statement made by Weber:

> ... every single important activity and ultimately life as a whole, if it is not to be permitted to run on as an event of nature but is instead to be consciously guided, is a series of ultimate decisions through which the soul – as in Plato – chooses its own fate, i.e. the meaning of its activity and existence.[55]

[55] M. Weber, *The Methodology of the Social Sciences*, 1949, p. 18. For a similar distinction made by Weber – between 'freedom of action' and the 'process of nature' – see D. Wrong (ed.), *Max Weber*, 1970, p. 111. Also J.P. Mayer, *Max Weber and German Politics*, 1956, p. 35.

Kant distinguished the science of physics from that of ethics, with the former formulating 'laws of nature' and the latter dealing with 'laws of freedom'.[56] This distinction was incorporated into Rickert's classification of the sciences into the 'natural' and the 'historical cultural' sciences – a classification accepted by Weber.[57] Although Weber was a thorough-going historical determinist,[58] the neo-Kantian distinction between the natural and historical cultural sciences had a fundamental influence on his methodological assumptions. He made a number of statements which reflected Rickert's influence in this respect:

> We can accomplish something which is never attainable in the natural sciences, namely the subjective understanding of the action of the component individuals. The natural sciences on the other hand cannot do this, being limited to the formulation of causal uniformities in objects and events and the explanation of individual facts by applying them ... subjective understanding is the specific characteristic of sociological knowledge.[59]

It is a commonplace in the sociological literature that Weber attempted to combine and integrate the methods of both the natural and historical cultural sciences, but, in fact, he attempted this integration only to a very limited extent. The natural scientific part of Weber's methodology was his acceptance of the necessity of empirical proof as a part of an historical determinist analysis; it was at the level of theoretical explanation, not the empirical testing of ideas, that he adopted the non-scientific methodology of 'subjective understanding'. The contradiction between the determinism of his empirical historicism and the voluntarism of his explanatory methodology seems to have

---

[56] T.K. Abbott (ed.), *Kant's Theory of Ethics*, 1927, p. 1.
[57] Weber, *Methodology*, p. 135.
[58] Ibid, p. 123; W.G. Runciman, *A Critique of Max Weber's Philosophy of Social Science*, 1972, p. 50.
[59] Max Weber, *Economy and Society*, 1968, Volume 1, p. 15.

escaped him, and the tension between a natural scientific explanation and a subjectivist methodology was never resolved:

> ... the more precisely they (uniformities) are formulated from a point of view of natural science, the less they are accessible to subjective understanding. This is never the road to interpretation in terms of subjective meaning. On the contrary, both for sociology in the present, and for history, the object of cognition is the subjective meaning complex of action.[160]

The polarity between natural scientific and meaningful explanations was reflected in the assertion that 'meaningfulness naturally does not coincide with laws as such, and the more general the law the less coincidence.'[61] Not only did Weber emphasize this contrast but in some sense defined the aim of his own work as combating the natural scientific method, particularly when applied to the study of human affairs.[62] The reasons for Weber's hostility to the natural sciences are complex. He had a dislike of the reduction of 'profound' metaphysical and religious preoccupations to questions answerable in terms of specialized technique and believed that the natural scientific attitude led to the 'disenchantment of the world':

> ... if these natural sciences lead to anything in this way, they are apt to make the belief that there is such a thing as the 'meaning' of the universe die out at its very roots.[63]

---

[60] Weber, *Economy and Society*, p. 13.
[61] Weber, *Methodology,* pp. 76-7.
[62] Ibid, pp. 186-7.
[63] Gerth and Mills, *From Max Weber*, p. 152. Weber's analysis of the 'disenchantment of the world' appears to have been grounded on changes in his own personal religious beliefs. Mayer, *Max Weber,* pp. 24, 25, 117. As a result of 'meaningfulness' associated with religious faith, 'the intellectual seeks in various ways, the casuistry of which extends into infinity, to endow his life with a pervasive meaning, and thus to find unity with himself, with his fellow men, and with the cosmos.' M. Weber, *The Sociology of Religion*, 1965, pp. 124, 125.

It was partly for this reason that he hated 'intellectualism as the worst Devil',[64] although his attitude towards scientific rationality was characterized by a complex and confused ambivalence.

His hostility to the natural sciences was linked to the belief that there was an inevitable quality to the development of the 'iron cage' of rationality; this largely explains his fascination with the distinctive rationality of the occidental world and his constant return to the theme of rationalization in his sociological work. But although this process of rationalization might appear to be itself a uniform generalisation of the type favoured by the natural sciences, Weber was concerned to combat just such an iron sense of scientific inevitability:

> When modern biology subsumed those aspects of reality which interested us *historically,* i.e. in all their concreteness, under a universally valid evolutionary principle, which at least had the appearance — but not the actuality — of embracing everything essential about the subject in a scheme of universally valid laws, this seemed to be the final twilight of all evaluative standpoints in all the sciences ... the naturalistic viewpoint in certain decisive problems has not yet been overcome.[65]

From this point of view, it might be said that it was Darwin's ghost, and not Marx's, that most haunted Weber.

---

[64] Gerth and Mills, *From Max Weber*, p. 152. Weber's wife Marianne, in her biography of Weber, revealed a very important aspect of his attitude towards northern protestant culture as follows: 'Everywhere [in Sicily] she saw a sight not offered in the big cities in the north: families with a childlike happiness despite their poverty. Of course the travellers [the Webers] could not really feel at home among these people who lived in the present, enjoyed their brief lives unquestionably, and apparently desired only to be happy. They simply took things as they came and did not seem to struggle or to strive for higher things.' See M. Weber, *Max Weber: a Biography,* 1975, p. 364.

[65] Weber, *Methodology*, pp. 86, 87.

The above passage indicates Weber's own interest in the study of history: 'the understanding of the characteristic uniqueness of the reality in which we move'.[66] The historical cultural sciences were primarily interested in the unique and concrete flow of particular historical events; analytical uniformities and generalizations might be occasionally useful as heuristic devices for understanding historical reality but this was rarely the case as 'the specific meaning which a phenomenon has for us is naturally not to be found in those relationships which it shares with many other phenomena'.[67] It is for this reason that the ideal types employed by Weber are not analytical concepts but are 'ideal' categories used for understanding the concrete motives of individuals in the actual historical process. This emphasis on individual action explains the sociological testament written by Weber towards the end of his life:

> ... if I have become a sociologist (according to my letter of accreditation) it is mainly to exorcise the spectre of collective conceptions which still lingers among us. In other words, sociology itself can only proceed from the actions of one or more separate individuals and must therefore adopt strictly individualistic methods.[68]

One of the most important of these individualistic methods is of course the ideal type. In order to understand Weber's use of this much abused term it is necessary to see it not only in terms of his individualism but also his 'idealistic' concern for subjective meanings and value commitments. His problem was the construction of conceptual tools and methodological assumptions which would allow him to undertake an analysis of social meanings and cultural values 'logically in exactly the

---

[66] Ibid, p. 72.
[67] Ibid, pp. 76, 77.
[68] W. Mommsen, 'Max Weber's political sociology and his philosophy of world history', *International Social Science Journal*, Volume XVII, 1965, p. 44, fn 2.

same way as causal analysis of personal actions.'[69] In this idealistic formula, Weber is attempting to bridge the gap between individual actions and social values, but we shall see there are good logical reasons why he failed in this. It is not possible here to discuss Weber's rather tortuous and confused analysis of ideal types but we may note the difficulty he had in constructing this conceptual bridge. He was forced to resort to metaphysical language to attempt to resolve this problem; e.g. in discussing ideal typical analysis of political structures he wrote:

> I am making it explicit to myself and others in an *interpretative* way the concrete, individual, and on that account, in the last analysis, unique form in which 'ideas' – to employ for once a metaphysical usage – are 'incorporated' into or 'work themselves out' in the political structure in question ... [70]

This resort to metaphysical language was in spite of an explicit rejection elsewhere of metaphysical notions such as a 'group mind' and the 'Hegelian idea' from which the individual components 'emanate'.[71] Although Weber rejected such philosophical idealism, in practice he smuggled some of its assumptions back into his work through constructs like the ideal type – and in this respect he was a methodological rather than a philosophical idealist.

It was on the basis of these methodological assumptions that Weber undertook to explain the process of historical change in terms of the motivations of individuals, so that for example when he discussed the origin of socialist communities he formulated the problem as follows:

> The real empirical sociological investigation begins with the question: What motives determine and lead the individual

[69] Weber, *Methodology*, p. 177.
[70] Ibid, p. 157.
[71] Weber, *Economy and Society*, p. xxxviii.

> members and participants in this socialistic community to behave in such a way that the community came into being in the first place and that it continues to exist?[72]

The central logical difficulty of a sociological explanation made in terms of these methodological assumptions – what Parsons has called a voluntaristic theory of social action – was pointed out by Durkheim in his *Rules of Sociological Method*:

> Where purpose reigns, there reigns also a more or less wide contingency; for there are no ends, and even fewer means, which necessarily control all men ... If, then, it were true that historic development took place in terms of ends clearly or obscurely felt, social facts should present the most infinite diversity; and all comparison should almost be impossible.[73]

Of course where ends and values are brought about by social or biological forces (environment and heredity) social facts can be the apparent result of purposive choices, but such choices simply become intermediary psychological processes between one social (or biological) fact and another. It is for this reason that Durkheim insisted that one social fact must be explained by another social fact, although he has other reasons for invoking the social which border on the metaphysical. In principle there is no logical reason why a social fact cannot be derived from a biological one, but given the fundamental biological similarity of human beings in all societies the only social facts to be explained by biological factors must necessarily be universally applicable to all social situations. (Perhaps an example of this type is to be found in universal differences in social role between the sexes – although there are some sociologists who would dispute the assumption that these differences are due to biological distinctions.)

---

[72] Ibid, p. 18.
[73] E. Durkheim, *The Rules of Sociological Method*, 1964, p. 94.

Whatever the role of biological factors in universal cultural facts, it is indisputable that societal *variations* cannot be explained by an unchanging *constant* factor such as man's biological nature (this assumes that there are no significant biological variations from one society to another). Similarly, voluntaristic choices made by individuals uninfluenced by environmental factors must necessarily result in a set of randomized personal aims. The most appropriate image to convey this effect is the statistician's scatter diagram: plot a number of individual points unrelated to each other and the result will be the absence of any focus or trend in the distribution of the points – in sociological terms an absence of a social fact involving shared expectations and social meanings.

Weber himself appears at times to have been aware of this logical difficulty in any voluntaristic theory of the origin of social factors. For example in *The Protestant Ethic* he wrote that

> In order that a manner of life so well adapted to the peculiarities of capitalism could be selected at all, i.e. should come to dominate others, it had to originate somewhere, and not in isolated individuals alone, but as a way of life common to whole groups of men.[74]

But it was at this point of trying to explain the origin of 'a way of life common to whole groups of men' that Weber had the greatest difficulty. With some perplexity he stated at the beginning of *The Protestant Ethic:*

> When we find again and again that, even in departments of life apparently mutually independent certain types of rationalization have developed in the Occident, and only there, it would be natural to suspect that the most important reason lay in differences of heredity. The author admits that he is inclined to

[74] Weber, *Protestant Ethic*, p. 55.

> think the importance of biological heredity very great. But ... it must be one of the tasks of sociological and historical investigation first to analyse all the influences and causal relationships which can be satisfactorily explained in terms of reaction to environmental conditions.[75]

Elsewhere, Weber speculated on the possibility that 'there are typical relations between ... certain kinds of rationality and the cephalic index or skin colour or any other biologically inherited characteristic.'[76] We do not have to dwell on this flirtation with racialist ideas, but merely note here that most sociologists would now reject the notion of racially determined culture patterns on empirical grounds. However, in the present context, the importance of these statements is that they reveal Weber's uncertainty about explaining 'a way of life common to whole groups of men', such as the protestant ethic. His reference to an explanation in terms of environmental conditions is paradoxical, for he makes it very clear in his methodological writings that he is primarily interested in historical explanations – and although he occasionally invokes factors such as the geographical environment, this is seen by him as a heuristic device along with the other modes of natural scientific analysis for the main business of meaningful explanation of unique historical sequences. As one scholar of Weber's works has recently put it: 'Since he was concerned with the unique course of Western rationalisation, he did not view it as a generic phenomenon ....'[77]

In a number of places however, Weber wrote of the process of rationalization as if it were an inevitable general 'law of development':

---

[75] Ibid, pp. 30, 31.

[76] M. Weber, *The Theory of Social and Economic Organisation,* 1947, p. 85.

[77] R. Bendix, G. Roth, *Scholarship and Partisanship: Essays on Max Weber*, 1971, p. 114.

> The increasing intervention of enacted norms is, from our point of view, only one of the components, however characteristic, of that process of rationalisation and association whose growing penetration into all spheres of social action we shall have to trace as a most essential dynamic factor in development.[78]

We have already seen how Weber believed that rationalization applied to many spheres of life in the occidental world and there are a number of other references to this process of general rationalization in his work, e.g. his statement in The Methodology *of the Social Sciences* that rationalization applies 'not only to a history of philosophy and to the history of any other intellectual activity but ... to every kind of history.'[79] He was careful however, as we have seen, to dissociate himself from metaphysical notions of history embodying 'a group mind' or the development of the Hegelian 'idea', as well as rejecting the natural scientific conception of analytical laws of development.

This rejection of laws of development can be seen in part as a legitimate objection to the tendency of reifying the process of rationalization into a metaphysical proposition – and Weber appears to have had Marx particularly in mind when he formulated this objection, as well as contemporaries of his such as Sombart.[80] But it is clear that Weber's position on this was also determined by his commitment to the historical cultural sciences and antagonism to naturalistic methodology.

However, Weber was forced by the logic of his own arguments to refer constantly to a 'law of development' in order to explain the process of rationalization. His most explicit reference to this is contained in the footnotes appended to *The Protestant Ethic* and is made in the context of a discussion of economic determinism:

---

[78] Weber, *Economy and Society,* Vol. 1, p. 333.

[79] Weber, *Methodology*, p. 34.

[80] Ibid, p. 103; Weber, *Protestant Ethic*, pp. 76, 77, 284.

> ... religious ideas themselves simply cannot be deduced from economic circumstances. They are in themselves, that is beyond doubt the most powerful plastic elements of national character, and contain a law of development and a compelling force entirely their own.[81]

Weber refers to 'autonomous laws' in other parts of his work[82] and even uses evolutionary terminology, e.g. in his sociological study of music he states that 'rationalization proper commences with the evolution of music into a professional art', and this is only one of a number of references to evolutionary rationalization in the sphere of music.[83]

Although Weber was prepared to concede that any one historical development was the result of the interaction of a number of forces – economic, political, religious etc. – in practice his prime interest was in tracing the influence of religious rationalization. It is in this area of his work that he came nearest to formulating universal sociological principles:

> Scientific progress is a fraction, the most important fraction, of the process of intellectualisation which we have been undergoing for thousands of years ... this intellectualist rationalization ... means that principally there are no mysterious incalculable forces that come into play, but rather that one can, in principle, master all things by calculation. This means that the world is disenchanted.[84]

This process of intellectualisation is based on

---

[81] Weber, *The Protestant Ethic*, pp. 277, 278.
[82] Weber, *The Protestant Ethic*, pp. 277, 278.
[83] M. Weber, *The Rational and Social Foundations of Music*, 1958, pp. 40, 41, 106, 107.
[84] Gerth and Mills, *From Max Weber*, pp. 138, 139.

> the metaphysical needs of the human mind as it is driven to reflect on ethical and religious questions, driven not by material need but by an inner compulsion to understand the world as a meaningful cosmos and to take up a position towards it.[85]

It is this rationalization of metaphysical ideas that presumably constitutes the law of development of religious ideas referred to above.

Although this law of development appears at first sight to be an example of a non-naturalistic 'idealistic' law, there is no reason why if it is stated in appropriate language it should not be accepted as a proper scientific proposition. Rationalization can be defined as a variable in continuum form which characterizes the process of social change; it is possible to see rationality as an emergent property of the human mind based on the biological structure of the human brain, a product of the process of natural selection during man's biological evolution.

The theme of rationalization has played a dominant intellectual role since at least the period of the Enlightenment, and nearly all the classic theories of social change have either explicitly or implicitly invoked the principle. Perhaps the most important sociological exponents of this principle other than Weber were Comte and Marx: Comte used the principle and applied it to a notion of general cultural development primarily at the level of ideas; Marx applied it to developments of technology and the means of production. As we have seen, Weber himself was primarily interested in the rationalization of man's need to understand the meaning of his life at a metaphysical level – and these very metaphysical questions were seen by him even in the first instance, as a function of rationality itself.[86] None of these theorists satisfactorily answer the fundamental question as

[85] Weber, *Sociology of Religion*, pp. 116, 117.
[86] Ibid, pp. 3, 6.

to why rationalization takes place in one society rather than another – in Weber's case of course the question being why did it develop so markedly in the occidental world and not elsewhere.

This argument about Weber's use of the concept of rationalization does not mean that he had abandoned an attempt to overcome the 'naturalistic dogma'. As we have seen, he did not recognize the law of development of rationalization as being a natural scientific proposition, and it is clear that his neo-Kantian voluntarism profoundly influenced his analysis of the development of the protestant ethic. In his General Economic History he wrote:

> In all times there has been but one means of breaking down the power of magic and establishing a rational conduct of life; this means is great rational prophecy.[87]

And a prophet according to Weber was 'a purely individual bearer of charisma'[88] – and 'charisma knows only inner determination and inner constraint'.[89] Frequently Weber writes of charisma as if it were the source of the deep personal individual freedom that he admired so much; other times he sees it as a function of irrational forces often of a biological nature. The association of charisma with irrationality is seen by him as leading to unfreedom – and freedom here is seen as a function of a rationally developed ethic. This contradiction is the result of a marked ambivalence on Weber's part towards both rationality and charisma which come to have a different significance depending on the context in which he is using them.

---

[87] M. Weber, *General Economic History*, 1961, p. 265.
[88] Weber, *Sociology of Religion*, p. 46.
[89] S.N. Eisenstadt (ed.), *Max Weber on Charisma and Institution Building,* 1968, p. 20.

The two forces of reason and charisma between them account for all the most important historical and social changes:

> In traditionally stereotyped periods, charisma is the greatest revolutionary force. The equally revolutionary force of reason works from without by altering the situations of action, and hence its problems, finally in this way changing men's attitudes towards them; or it intellectualizes the individual.[90]

There are obvious difficulties with this idea of charisma bringing about accumulative social changes. Inasmuch as the concept is used to refer to the profoundly personal creation of ultimate values,[91] all the logical objections to voluntaristic theories of action discussed earlier in the paper would apply. Charisma in itself will over a long enough period of time and from one social situation to another neutralize itself through a process of randomization, except where it is influenced by a socially structured set of influences. But pure charisma as such is an individual phenomenon and analytically must be sharply distinguished from socially determined facts. Of course it is possible to imagine a single individual's charisma being so powerful as to overwhelm all rival charismas, but this could only account for the influence of charisma on a limited single cultural situation defined by the immediate contacts of the charismatic leader. Any influence beyond this will be expressed through ideas and thus becomes subject to the principle of randomization in the absence of socially determined choices. Sociological facts of the stature of capitalist culture had to originate 'not in isolated individuals alone, but as a way of life common to whole groups of men'. In actual historical situations charisma is associated with the

[90] Ibid, pp. 53, 54.

[91] For an example of this see Weber's stress on Luther's personal experience and its importance for the disappearance of monasticism. Weber, *Protestant Ethic*, p. 121.

complete range of ideas and ethics, so that for example the charisma of the Protestant Reformers no doubt can be matched by that of their Jesuit opponents.

The analysis of the development of the protestant ethic appears to contain equal emphasis on the role of both intellectual rationalization and charismatic innovation. .The former refers basically to the level of ideas and changes in theological thinking; the latter to innovations in ethical doctrine propounded by the charismatic leaders of the Reformation. In this context it is easy to understand how many commentators on Weber's work have mistakenly assumed that ethical teaching was the major variable in the analysis. The question must be raised as to why Weber insisted that theological ideas had causal priority over ethical doctrine. The answer lies, I believe, in his uneasy awareness of the logical problems of voluntaristic explanations including those made in terms of charisma. Of course the same problem could be raised with respect to theological ideas which can be said to also originate through the innovations of particular individuals.

The difference is that developments of ideas can be classified according to the principle of increasing rationalization, whereas there is no obvious equivalent principle with which to classify changes in ethical doctrine. Weber did talk about the rationalization of ethical life, but although he is using the term rationalization here in a somewhat different sense to that used when applied to the level of ideas, in the last resort the concept returns the analysis back to the process of intellectual rationalization associated with the development of ideas.

It is now possible to understand why Weber not only gave priority to theological ideas in his analysis of the protestant ethic but also why he laid so much stress on Calvinist theology. According to Weber, Calvin's doctrine is derived not, as with Luther, from religious experience, but from logical necessity of his thought; therefore its importance

increases with every increase in the logical consistency of that religious thought.[92]

Logical consistency is one of Weber's main criteria of rationality and was viewed by him as the most important characteristic defining theological rationality. It might be thought that he chose Calvinist theology as a key starting point of his analysis on empirical grounds, i.e. that he believed it to be empirically the most important of the theological doctrines that he considered. But Weber showed an uneasy awareness of a major problem in this part of his analysis:

> ... the types of moral conduct in which we are interested may be found in a similar manner among the adherents of the most various denominations ... similar ethical maxims may be correlated with very different dogmatic foundations ... It would almost seem as though we had best completely ignore both the dogmatic foundations and the ethical theory and confine our attention to the moral practice so far as it can be determined.[93]

Weber went on to reject this difficulty on empirical grounds, although he produced no evidence in any of his work to show that the Calvinists were any more thoroughly committed to the protestant ethic than any of the other Puritan groups with different theologies – such as the Arminian Quakers and Wesleyan Methodists. In fact a cursory examination of the evidence reveals that if anything the contrary is true and it is difficult to believe that Weber was unaware of this. If Calvinist theology was not chosen on empirical grounds – and Weber does not cite any evidence in support of this – it is likely that it was selected on theoretical grounds, specifically because of Weber's pre-occupation with finding out 'whose intellectual child'[94] the

---

[92] Ibid, p. 102.
[93] Ibid, p. 97.
[94] Ibid, p. 78.

protestant ethic was in terms of the dominant notion of rationalization.

The logical consistency of Calvinist theology was outlined by Weber in a brief passage in *The Protestant Ethic*:

> To assume that human merit or guilt played a part in determining; this destiny (of man) would be to think of God's absolute free decrees, which have been settled from eternity, as subject to change by human influence, an impossible contradiction ... His quite incomprehensible decrees have decided the fate of every individual and regulated the tiniest details of the cosmos from eternity.[95]

In other words, if God is viewed as being totally omnipotent and omniscient – as Christians have traditionally assumed – it is logically impossible by definition for him not to know the results of his creative activities before the actual creation of the universe. It is also by definition impossible for such a God to diminish his own power and transfer part of it to man in the form of free-will – such a transfer would limit his power, contradicting his total omnipotence. Weber's arguments about the psychological consequences of the Calvinist belief in pre-destination are very familiar and need only be touched on briefly here. The Calvinist is faced with the problem of reconciling his need for salvation with his belief that it is impossible for him either to know or to be able to influence his salvation in any way. This creates acute metaphysical anxiety which is dealt with (this solution evolves over time) through using the ethical notion of success in one's calling as a 'sign' of salvation.

Weber goes to great pains to point out that this solution is a psychological not a logical one to the problems posed by a belief in predestination – according to him, the logical outcome is 'fatalistic resignation', but the Calvinist does not follow this path because of his

[95] Ibid, pp. 103, 104.

overwhelming need to 'prove' himself in the face of his omnipotent God (the Calvinist's economic interests and social class position also predispose him to accept this illogical solution).[96] The doctrine of predestination creates a decisive psychological motive in the form of anxiety which is channelled into the active performance of a calling through the need of the Calvinist to prove himself.

The doctrine of proving oneself before God was postulated by Weber as being common to all Puritan groups[97] – and inasmuch as it was a part of the Christian ethic it was a doctrine common to all Christians.[98] This however poses a problem in Weber's analysis, for on the one hand he states that the doctrine was a part of the 'Christian ethic' and on the other that 'the actual evolution to the proof of faith through works, which is the characteristic of asceticism, is parallel to a gradual modification of the doctrines of Calvin'.[99] Implicit in the latter statement is the idea that the Calvinist's belief in predestination had somehow led to a natural development of evolving the doctrine of proof – yet this doctrine would have been associated with Calvin's original body of ethics as a part of the 'Christian ethic'. Weber's analysis could always be rescued from this objection by emphasizing the role of 'practical interests' in determining the ethical consequences of the Calvinist's belief in predestination,[100] but this begins to shift the emphasis heavily away from a 'spiritualistic' explanation towards an economic one.

Weber does however at one point relate the doctrine of proof to the mainstream of his sociological analysis:

---

[96] Ibid, p. 232.
[97] Gerth and Mills, *From Max Weber*, p. 321.
[98] Weber, *Sociology of Religion*, p. 203.
[99] Weber, *Protestant Ethic*, p. 228.
[100] Ibid, p. 232.

> Grace could not be guaranteed by any magical sacraments, by relief in the confession, nor by individual good works. That was only possible by proof in a specific type of conduct unmistakably different from the way of life of the natural man. From that followed for the individual an incentive methodically to supervise his own state of grace in his own conduct, and thus to penetrate it with asceticism.[101]

This returns the discussion to the theme of rationalization – the elimination of magical sacraments and religious ritual through the growth of scientific rationality. Weber distinguished a 'subjectively rational' action from 'one which uses the objectively correct means in accord with scientific knowledge'.[102] Although he did not explicitly state that the elimination of magic is due to the growth of scientific rather than subjective rationality, this is implicit in his analysis, i.e. it is the development of a rational scientific emphasis on empirical observations rather than the internal logical rationalization of magic itself, which is important in its disappearance.

Weber believed that this process played a key role in cultural development:

> the complete elimination of salvation through the Church and the sacraments (in Puritanism) ... was what formed the absolutely decisive difference from Catholicism. That great historic process in the development of religions, the elimination of magic from the world which had begun with the old Hebrew prophets and, in conjunction with Hellenistic scientific thought, had repudiated all magical means to salvation as superstition and sin, came here (in Puritanism) to its logical conclusion. The genuine Puritan even rejected all signs of religious ceremony at the grave and buried his nearest and dearest without song or ritual in order that no

[101] Ibid, p. 153.
[102] Weber, *Methodology*, p. 34.

> superstition, no trust in the effects of magical and sacramental forces on salvation, should creep in.[103]

The consequence of the elimination of magic was that

> There was no place for the very human Catholic cycle of sin, repentance, atonement, release, followed by renewed sin. The moral conduct of the average man was thus deprived of its planless and unsystematic character and subjected to a consistent method for conduct as a whole.[104]

This displacement of magic was not confined to any one Puritan denomination; according to Weber they were all equally affected by the process.[105] One of the most important features of the elimination of magic was the disappearance of the confessional: 'it was a psychological stimulus to the development of their (the puritans') ethical attitude. The means to a periodical discharge of the emotional sense of sin was done away with'.[106]

Although Weber did not develop this theme about the psychological consequences of the disappearance of institutional magic, he made a number of isolated points which are capable of being formulated more systematically. One of the consequences of the diminution of the role of the church and its administration of sacred ritual was that the puritan's 'intercourse with his God was carried on in deep spiritual isolation'[107] and there 'was a feeling of unprecedented inner loneliness'.[108] The elimination of 'the doctrine of salvation through the Church' culminated in the Quaker doctrine of the

---

[103] Weber, *Protestant Ethic*, pp. 105, 106.
[104] Ibid, p. 117.
[105] Ibid, p. 119.
[106] Ibid, p. 106.
[107] Ibid, p. 107.
[108] Ibid, p. 104.

'significance of the inner testimony of the Spirit in reason and conscience'.[109] The final result of this process is

> that distinctive type of guilt and, so to speak, godless feeling of sin which characterises modern man precisely as a consequence of his organisation of ethics in the direction of a system based on an inner religious state, regardless of the metaphysical basis upon which the system was originally erected.[110]

The similarity of this part of Weber's analysis with that made by Durkheim in *Suicide* is too striking to be ignored. The elimination of institutionalized magic and ritual activities was seen by Durkheim as leading to an increase in the rate of 'egoistic' suicide – an increase due to a decline in the amount of integration between the Protestant individual and his religious institutions (using. this term to refer to both belief and activity). Integration protects the individual from excessive reliance on himself which when carried to the extreme produces deep feelings of melancholy and eventually suicide. Weber and Durkheim disagreed about the role of intellectual rationalization in bringing about these results: Durkheim saw the intellectualism of the 'egoist' as a by-product of general social disintegration rather than as a causal factor in the process. Neither Weber nor Durkheim gives an adequate account of how religious institutions function to protect individuals from these feelings of anxiety, guilt and depression, for they both lacked a satisfactory psychological framework necessary to achieve such an explanation.

Although Weber's interpretations of social psychological situations are couched exclusively in ordinary language, it is possible to trace a set of psychological assumptions about the nature of the protestant ethic which are very similar to the postulates of psychoanalysis. When discussing puritan attitudes towards sport Weber wrote:

---

[109] Ibid, p. 149.
[110] Weber, *Sociology of Religion*, p. 206.

> Sport was accepted if it served a rational purpose, that of recreation necessary for physical efficiency. But as a means for the spontaneous expression of undisciplined impulses, it was under suspicion; and in so far as it became purely a means of enjoyment, or awakened pride, raw instincts or the irrational gambling instinct, it was of course strictly condemned. Impulsive enjoyment of life, which leads away from work in a calling and from religion, was as such the enemy of rational asceticism ...'[111]

The contrast between rational self-control on the one hand and the irrational acting out of impulses on the other is very similar to the distinction made by Freud between the super-ego and the id. The similarity is perhaps more clearly revealed by a comment by Weber on the relationship between the protestant ethic and sexuality:

> Rational ascetic alertness, self-control, and methodical planning of life are seriously threatened by the peculiar irrationality of the sexual act, which is ultimately and uniquely unsusceptible to rational organisation.[112]

The language used by Weber in these passages reveals a meaning of the word 'rational' which extends that already discussed in connection with intellectual rationality: ethical rationality is the equivalent of the constraint of biological and emotional impulses which by their very nature threaten the deliberate and conscious reflection of intellectual rationality. From the other side, intellectual rationality is in part responsible for the suppression of sexual spontaneity; historically there had been

[111] Weber, *Protestant Ethic*, p. 167.
[112] Weber, *Sociology of Religion*, p. 238.

> a gradual turning away from the naive naturalism of sex. The reason and significance of this evolution, however, involve the universal rationalization and intellectualization of culture.[113]

Weber saw the results of this 'turning away from the naive naturalism of sex' in very much the same way as did Freud: the sublimation of sexual energy into work and rationality. Weber summarized his position when writing that

> the rejection of all naive surrender to the most intensive ways of experiencing existence, artistic and erotical, is as such only a negative attitude. But it is obvious that such a rejection could increase the force with which energies flow into rational achievement, both the ethical as well as the purely intellectual.[114]

Weber (like Freud) was ambivalent about this process of sublimation of sexual and emotional energy, for rationality can proceed in a variety of directions; positively in that of a conscious rationalization of ultimate values; or negatively, at the expense not only of custom, but of emotional values.[115] It was presumably these negative consequences that led Weber to· view 'intellectualism as the worst devil'.[116]

The characteristics of the protestant ethic – 'rational ascetic alertness, self-control, and methodical planning of life' – are not according to Weber confined specifically to a religious context but are also the ethical qualities included in the definition of the secularized spirit of capitalism. The title of Weber's thesis is rather misleading in this respect: it suggests that the protestant ethic is a causally significant determinant of the independent spirit of capitalism, but it is clear from his methodological writings that they do not have a

---

[113] Gerth and Mills, *From Max Weber*, p. 344.
[114] Ibid, p. 350.
[115] M. Weber, *Theory of Economic and Social Organisation*, 1947, p. 112.
[116] There is some evidence that Weber failed to consummate his marriage because of sexual impotence. See Mitzman, *The Iron Cage*, p. 276.

'determinate' relationship but rather have a 'measure of inner affinity'.[117] The spirit of capitalism is nothing but a more secularized version of the protestant ethic which develops over time through the process of rationalization. Perhaps this is revealed most clearly in Weber's summary of the nature of the spirit ofcapitalism:

> the *summum bonum* of this ethic, the earning of more and more money, combined with the avoidance of all spontaneous enjoyment of life is above all completely devoid of any eudaemonistic not to say hedonistic, admixture ... it expresses a type of feeling which is closely connected with certain religious ideas.[118]

Weber went to great pains to dispel the idea (which some of his critics had mistakenly attributed to him) that the spirit of capitalism was the same thing as acquisitiveness and greed for gain:

> Unlimited greed for gain is not in the least identical with capitalism, and still less its spirit. Capitalism *may* even be identical with the restraint, or at least a rational tempering of this irrational impulse.[119]

The language of this passage – 'the restraint, or at least a rational tempering of this irrational impulse' – indicates the identical ethical and psychological nature of the protestant ethic and the spirit of capitalism. Both essentially are ethics which oppose what Freud called the pleasure principle and institutionalize ego and super-ego psychological forces. Weber does however qualify this point about acquisitiveness in stating that the puritans did not struggle against rational

---

[117] Weber, *Economy and Society*, p. xxxviii.
[118] Weber, *Protestant Ethic*, p. 53.
[119] Ibid, p. 17.

acquisition, but against the irrational pursuit of wealth.[120] The result of this ethic was that

> When the limitation of consumption is combined with the release of acquisitive activity, the inevitable practical result is obvious: accumulation of capital through ascetic compulsion to save.[121]

The combined results of the 'compulsion to save' and diligent activity in a calling led, in interaction with economic and other forces, to the development of modern capitalism.

Although the overwhelming emphasis of Weber's empirical analysis is on the causal influence of religious forces on economic development, he did also discuss the effect of economic factors on religious ideas and ethics. He explicitly stated that he believed this latter type of causal relationship to be of great importance:

> For those to whom no causal explanation is adequate without an economic (or materialistic as it is unfortunately still called) interpretation, it may be remarked that I consider the influence of economic development on the fate of religious ideas to be very important.[122]

Weber's references to the economic determination of religious ideas are to be found scattered in rather piecemeal fashion in a number of his works. He located the protestant ethic in a Christian tradition associated distinctively with an urban status group of craftsmen and small traders:

> The wandering craftsman first appears at the beginning of our era. Without him the spread of Christianity would have never been possible; it was in the beginning the religion of the wandering craftsmen, to whom the Apostle also belonged, and his proverb

---

[120] Ibid, p. 171.
[121] Ibid, p. 172.
[122] Ibid, p.277, fn 84.

'he who does not work shall not eat' expressed their ethics.[123]

Not only was this social group associated with the birth of Christianity, but during the Middle Ages it 'remained the most pious, if not always the most orthodox, stratum of society.'[124] It was the same group who formed the backbone of puritanism:

> With great regularity we find the most genuine adherents of Puritanism among the classes which were rising from a lowly status, the small bourgeois and farmers.[125]

Weber gave a number of reasons as to why this social group should be so predisposed towards puritanical Christianity. Primary among these reasons was the personal economic self-interest contained in the ownership of small amounts of property:

> The appropriation of the means of production and personal control, however formal, over the process of work constitute among the strongest incentives to unlimited willingness to work. This is the fundamental basis of the extraordinary importance of small units in agriculture, whether in the form of small-scale proprietorship or small tenants who hope to rise to the status of owner.[126]

The acquisition of wealth destroys this ethic of work among this lower-middle class group; Weber illustrated this point by quoting Wesley's famous statement that 'wherever riches have increased, the essence of religion has decreased in the same proportion'.[127] The other major reason for the puritanism of this stratum lay according to Weber in its

---

[123] Weber, *General Economic History*, p. 111.
[124] Weber, *Sociology of Religion*, p. 95.
[125] Weber, *Protestant Ethic*, p. 174.
[126] Weber, *Theory*, p. 242.
[127] Weber, *Protestant Ethic*, p. 175.

elimination of magical and traditional styles of thought (we have already discussed the ethical consequences of this intellectual development) – and this process of rationalization was essentially a function of the urban style of life of the lower-middle classes:

> When one compares the life of a lower-middle class person, particularly the urban artisan or the small trader with the life of the peasant, it is clear that middle class life has far less connection with nature. Consequently, dependence on magic for influencing the irrational forces of nature cannot play the same role for the urban dweller as for the farmer. At the same time, it is clear that the economic foundation of the urban man's life has a far more rational essential character, viz., calculability and capacity for purposive manipulation.[128]

Weber's willingness to consider economic explanations is further illustrated by his position on the relationship between science and the process of rationalization: in his essay on science he summarized this when stating that 'intellectualist rationalization' had been 'created by science and scientifically oriented technology'.[129] It is here that we see Marx's greatest influence over Weber. The location of religious ideas and ethics in an economic context does not however solve the fundamental problem that Weber set out to solve: 'the special peculiarity of Occidental rationalism'. Neither the emphasis on intellectualist or economic rationalization can explain why it was in the occidental world that rationality developed particularly in either or both these spheres. As we have seen, Weber attempted to give an historical answer to the problem but raised a further difficulty which he never resolved: in criticising a Marxist speaker at the first meeting of the German Sociological Association, Weber

[128] Weber, *Sociology of Religion*, p. 97.
[129] Gerth & Mills, *From Max Weber*, p. 139.

revealed his own position on the nature of historical explanation:

> I would like to protest against the statement made by one of the speakers that some one factor, be it technology or economy, can be the 'ultimate' or 'true' cause of another. If we look at the causal lines, we see them run, at one time, from technical to economic and political matters, at another from political to religious and economic ones etc. There is no resting point.[130]

It is for this reason that he accepted that in the analysis of cultural phenomenon 'the appearance of the result is, for every causally working empirical science determined not just from a certain moment but 'from eternity'.[131]

This infinite causal regress is clearly a very unsatisfactory mode of explanation, for in the last resort it explains both everything and nothing. Although in principle Weber was prepared to accept that causal explanation could be regressed infinitely, in his substantive work on the development of the protestant ethic he was 'not primarily interested in the origin, antecedents, or history of these ascetic movements, but (took) their doctrines as given in a state of full development'.[132]

It must be asked what principle enabled Weber to decide the point of departure for his analysis. In practice it was the principle of understanding which allowed him to meaningfully explain the 'inner affinity' of the protestant ethic with the spirit of capitalism. The function of understanding in empirical causal analysis was 'to establish

---

[130] Bendix & Roth, *Scholarship*, p. 242.

[131] Weber, *Methodology*, p. 187.

[132] Weber, *Protestant Ethic*, p. 220. Weber did however make a number of substantive references to earlier historical developments and stated elsewhere that the 'causal regress' of 'present-day Christian capitalistic culture' might have to extend back 'into the Middle Ages or Antiquity.' Weber, *Methodology*, p. 155.

the really decisive motives of human actions'[133] – and to enable Weber to break into the 'eternal stream' of history for a point of departure of analysis. This point is necessarily a subjective rather than a material factor of analysis: Weber's methodology inescapably involved the understanding of subjective meanings. Material circumstances cannot be 'understood' – a statement about them can only be invoked on Weber's methodology as a subsidiary heuristic device. The selection of puritan theology and the protestant ethic as a point of departure for Weber's analysis of the emergence of modern capitalism is therefore an example of a deeply partisan idealistic methodology.

The fundamental analytical problem that Weber set out to solve thus remains unanswered: what were the sociological factors responsible for the pervasive and systematic rationalization of occidental culture? Clearly Weber's references to a racial explanation of this cultural development form no basis whatsoever for a solution to this problem (the development of Japanese capitalism is by itself sufficient to discredit this purely speculative notion). Its solution lies beyond the scope of this paper, although it is intended to return to this question in future work. Weber's greatest achievement was to analyse the relationship between the disenchantment flowing from the process of rationalization and the evolution of the protestant ethic. This involved the sublimation of anxiety and guilt resulting from the destruction of protective belief and institutional magic (e.g. the elimination of the confessional), into the rationalized, methodical and sober ethic associated with both puritanism and certain aspects of occidental capitalism. Further work is required to elaborate the nature of the psychological forces

[133] Weber, *Methodology*, p. 14. This notion that it is possible 'to establish the really decisive motives of human actions' is reflected in Weber's conclusion that 'the real roots of the religious ethics which led the way to the modern conception of calling lay in the sects and heterodox movements, above all in Wyclif.' Weber, *Protestant Ethic*, p. 203.

that were involved in this process and why they took the form that they did. Although the protestant ethic has come to influence cultures outside of its area of origin, the question raised by Weber for comparative sociology still remains: why did the process of rationalization first develop in Western Europe, and not elsewhere?

Chapter 3: Max Weber and Environmental Determinism.[134]

The process of rationalization was seen by Weber as occurring within the occidental world at periodical intervals: in ancient Greece, Renaissance Italy, Puritan Holland and England. It is not therefore in practice conceived by him as a linear cultural development or a series of unique accidental events, but a process which perennially but cumulatively repeats itself in the Occident. And it was this which led him against his own methodological inclinations to refer to the process of rationalization as a 'law of development'.

Weber was also forced by the logic of his own analysis to raise the possibility of a racial determination of occidental culture, but at the same time indicated what the only alternative explanation was an environmental one. In practice he conceived environmental explanations as being historical and these cannot solve 'the special peculiarity of Occidental rationalism.' Yet in principle the nature of a satisfactory solution to Weber's problem is to be found through the logic of scientific analysis. If social science is viewed as a natural scientific discipline which gives an objective casual account of social reality – as this paper does – then in the last resort this environmental factor must be a geographical one.

The logic is this assertion is as follows: 1. Heredity and environment exhaust the range of possible natural scientific explanations. 2. Subjective voluntaristic theories of social action are logically incapable of explaining systematic societal variations because of randomization of individual action. 3. Heredity also cannot explain societal variations because of this process of randomization – this assumes that biological race does not determine culture. 4. The only remaining factor which is both environmental and objective is geographical environment.

[134] Unpublished paper.

Weber himself did not discuss the nature of sociological explanations in terms of the environment. Talcott Parsons has attempted however to develop Weber's theory of social action in a more systematic fashion and has dealt with the problem of environmental explanations at a general theoretical level. In the summary of his theoretical position in *Societies: Evolutionary and Comparative Perspectives*, Parsons distinguished two 'environments of action': the 'physical-organic environment' and 'ultimate reality'[135] The former refers essentially to the geographical environment but would also include all forms of biological life other than man himself.

The latter is so ambiguous as to require clarification. At first sight 'ultimate reality' might appear to refer to ideas that men have about such a reality, but Parsons makes it very clear that his referring to an 'environment of action', i.e. an environment external to all modes of social action inducing religious ideas. That this is not an accidental use of words but a fundamental part of Parsons' analysis is revealed in his earlier writings. The most telling summary of these is his discussion of Durkheim's ideas on religion in *The Structure of Social Action*:

> Religious ideas, then, may be held to constitute the cognitive bridge between men's active attitudes and the non-empirical aspects of their universe ... The specific content of religious ideas is no more completely determined, probably not nearly as much, by the intrinsic features of the non-empirical than is scientific knowledge completely determined by the 'external world'.[136]

What Parsons is saying here is that the 'non-empirical world' is in part a determinant of men's religious ideas – not exactly

---

[135] T. Parsons, *Societies: Evolutionary and Comparative Perspectives,* 1966, p. 20.

[136] T. Parsons, *The Structure of Social Action*, Volume 1, 1968, p. 424. See the discussion of Durkheim's treatment of religious ideas by Parsons: Ibid, pp, 411-429. For his position on the role of non-empirical reality in explaining cultural facts, see also his article 'The place of ultimate values in sociological theory', *Ethics*, Volume 45, 1934-1935.

Hegel's 'God in History', but at least an indeterminant supernatural/metaphysical force at work. This explicit supernatural idealism at least has the merit of pointing out the logic of Parsons' 'cultural determinism', and it allows us to decisively reject such idealism as being incompatible with sociology as a natural scientific discipline. However, it must be pointed out that it has been possible for Parsons to present such an argument as a scientific one, because his theory of social action has the authority of research derived from Weber. Parsons erroneously confuses a scientific analysis of social action with a particular kind of scientific orientation on the part of the social actor himself. In fact it is in principle just as valid to give a scientific explanation of 'irrational' non-scientific ideas and orientations as it is of 'rational' scientific ones. If we eliminate Parsons' 'ultimate reality' as a causal variable in sociological analysis – and if we subscribe to the notion of sociology as a natural social science we must – the only theoretically valid part of his analysis of environments is that part which deals with the objective observable 'physical-organic environment'.

Both Marx and Durkheim came near to applying this principle of objective environmental analysis in their sociological work. Marx's 'materialism' and emphasis on the economic determinants of social life is compatible with geographical determinism, although he only occasionally located his analysis in a specific geographical context. Environmental determinism is also compatible with non-economic explanations of social facts, in particular those made in terms of political structures. Durkheim accepted in principle the sociological importance of geographical environment but in practice was much more interested in another objectives determinant of social life – changes in population density. However, alterations in population density can account for historical processes of change but not for systematic variations in the development of different societies. For the question must be always raised: as to why population grew in one type of society and not another?

Of course population does change in a particular society for 'accidental' reasons – perhaps an example of this is the appearance and disappearance of the plague in Europe – but this kind of change cannot account for systematic changes in the social structure in a number of different contexts that interested Weber. Rationality appears and reappears so systematically in occidental societies that he was forced to search for some 'fixed' factor which was a 'constant' in the historical process – and if we reject the constant factor of biological race, as we must, the only other factor which is both objective and relatively unchanging is geographical environment.

It might be objected that geographical environment cannot be a 'determining cause of social development, for that which remains almost unchanged in the course of tens of thousands of years cannot be the chief cause of development.'[137] This is certainly the case, but what can be explained by geographical environment is variations in the process of development between different societies – historical development itself is brought about by factors such as technological innovation and the process of intellectual rationalization. The logic of this type of distinction is identical to that employed by biological evolutionary theory which locates biological changes in the context of geographical environments. The genetic mechanisms of biological change are quite distinct from the process of natural selection: the former is primarily a function of 'random' genetic mutations, the latter a function of adaptations to geographical environments.

Although Weber rejected the above kind of argument on account of his methodological idealism, in practice he came near to applying it in his actual attempt to explain cultural variations between one society and another. For example his explanation of the emergence of the free artisan in northern Europe:

---

[137] A statement made by Stalin quoted in K.A. Wittfogel, *Oriental Despotism*, 1957, p. 408.

> In antiquity the slaves remained in the power of the lord, while in the middle ages they became free. In the latter there is a broad stratum of free craftsmen unknown to antiquity. The reasons are several: the difference in the consumptive requirements of the Occident as compared to all other countries of the world ... The contrast rests on climatic differences. While in Italy heat is not indispensable, even today, and in antiquity the bed counted as a luxury – for sleeping one simply rolled up one's mantle and lay down on the floor – in Northern Europe stoves and beds were necessities. The oldest guild document which we possess is that of the bed ticking weavers of Cologne ... again in consequence of climatic relations, the German appetite was greater than that of the southerner.[138]

And in this context, Weber might have added the commonplace observation that the temperate climate of the northern European countries is much more conducive to the protestant ethic of work than that of the hot southern countries. Weber's most comprehensive statement concerning the environmental determinant of cultural variations is to be found in his study of the religion of China:

> In sharp contrast with the Occident, but in harmony with Indian conditions, the [Chinese] city as an imperial fortress actually had fewer formal guarantees of self-government than the village ... This can be explained in terms of the different origins of the occidental and oriental city. The polis of antiquity originated as an overseas trading city, however strong its base in landlordism, but China was predominantly an inland area ... On the other hand, the characteristic inland city of the occidental Middle Ages, like the Chinese and the Middle Eastern city, was usually founded by princes and feudal lords in order to gain money rents and taxes. Yet at an early date the European city turned into a highly privileged association with fixed rights. These could be and were extended in a planned manner because at the time the lord of the city lacked the technical means to

[138] M. Weber, *General Economic History*, 1961, p. 107.For other examples of Weber's analysis of cultural facts in terms of the climate see M. Weber, *The Sociology of Religion*, p. 98; M. Weber, *The Rational and Social Foundations of Music*, 1958, p. 24.

> administer the city. Moreover, the city represented a military association which could successfully close the city gate to an army of knights. In contrast, the great Middle Eastern cities, such as Babylon, at an early time were completely at the mercy of the royal bureaucracy because of canal construction and administration. The same held for the Chinese city despite the paucity of Chinese central administration. The prosperity of the Chinese city did not primarily depend upon the citizen's enterprising spirit in economic and political ventures but rather upon the imperial administration, especially the administration of rivers.

This statement of Weber's could very easily be mistaken for one made by Marx on the theme of 'oriental despotism', with its emphasis on the role of economic factors and its general geographical materialism.[139] Weber was very aware of the possibility of an 'explanation of a political structure from its geographical background.'[140]

> Royal bureaucracies (in the East) were developed to carry out the regulation of river traffic and execution of irrigation policy with the consequent establishment of a process leading towards the bureaucratization of the entire administration. This permitted the king through his staff and revenues supplied them to incorporate the army into his own bureaucratic management ... No political community of citizens could arise on such a foundation for there was no basis for military independence of royal power.[141]

This emphasis on irrigation management for explaining 'oriental despotism' has been developed in detail by Wittfogel in his

---

[139] For Marx's analysis of 'oriental despotism' see Wittfogel, *Oriental Depotism*, especially p. 374.

[140] The example of this in the text refers of course to the geographical determination of political structure via economic forces. Weber was also aware of the direct effect of geographical environment on political structure, e.g. his comments on the peculiar geographical position of Germany and the consequent effects on its political life. J.P. Mayer, *Max Weber and German Politics*, p. 20.

[141] M. Weber, *The City*, 1968, pp. 119, 120.

Oriental Despotism. The thesis has been subsequently attacked on empirical grounds that the administration of irrigation systems did not always require large-scale bureaucratic structures but in many cases was organized on a small-scale local basis.[142] However, it is possible to restate the hypothesis in a much more acceptable form, whereby the regional management of irrigation is only a stage, although a significant one, in the development of 'oriental despotism'. Julian Steward has come near to restating the hypothesis in this form and has added to it by invoking military conquest as a further variable in the analysis.[143] In the context of the present paper's emphasis on geographical determinism, military conquest would have to be analysed in terms of physical accessibility of one region to another through factors such as navigable seas, lakes, rivers and canals. It is likely however, that other geographical variables are also important in explaining the emergence of 'oriental despotism' in particular societies.

Emerging out of this part of Weber's work which deals with the geographical determinants of culture, is the theme that some geographical environments through economic and political forces create the social conditions which free men for independent action, whereas others force men into personal dependency. The former was seen by Weber in terms of the occidental city where 'city air makes man free'.[144] The latter was viewed by him mainly in the context of 'oriental despotism' which arose out of the 'iron cage' of bureaucratic control. Freedom was the crucial factor in the development of rationality. This was true according to Weber in three major contexts: 1. 'A powerful organization of priests' possessing 'the greatest

---

[142] See for example R.M. Adams, *The Evolution of Urban Society*, 1966, pp. 15, 66-68, 74, 76; *International Encyclopaedia of Social Sciences*, 1968, Volume 1, p. 424 and Volume 16, pp. 204, 210.
[143] See J. Steward (ed.), *Irrigation Civilizations: a Comparative Study*, 1995, pp. 1-5, 58-78.
[144] Ibid, p. 94.

measure of independence from political authorities'.[145] 2. Prophets as lay preachers with powers of 'sovereign independence'.[146] 3. 'The peculiar freedom of urbanites' in the occidental city.[147] Weber never spelt out the reasons for this association between freedom and rationality but there are suggested explanations in negative statements such as he made in his study of methodology:

> The points of departure of the cultural sciences remain changeable throughout the limitless future as long as a Chinese ossification of intellectual life does not render mankind incapable setting new questions to the eternally inexhaustible flow of life.[148]

His reference to 'a Chinese ossification of intellectual life' is of course employed here as a metaphor for what Weber feared would be the consequence of the spread of bureaucratic control in modern life. Rationality results from freedom through the critical questions that individuals are naturally predisposed to ask through the 'metaphysical needs of the human mind as it is driven ... to understand the world as a meaningful cosmos.' The 'iron cage' of bureaucracy inhibits the development of rationality because it stereotypes the questions that men ask through the process of routinisation and centralised control.

The process of rationalization was illustrated by the poet John Milton, who described in 1641 his fellow Londoners 'sitting by their studious lamps, musing, searching, revolving new notions and ideas ... reading trying all things, assenting to the force of reason ...'[149] It was possible for Milton and others to

---

[145] Weber, *Sociology of Religion*, p. 73.
[146] Ibid, p. 78.
[147] Gerth and Mills, *From Max Weber*, p. 269.
[148] Weber, *Methodology*, p. 84. Weber recognized of course that there was a significant amount of rationalization in Chinese and other oriental cultures, but it was his view that it had become 'ossified' in the oriental world in a way that it had not in the Occident.
[149] Worden, *The English Civil Wars*, p. 79. In 1650 Wallington a London artisan noted in his diary that he had not only written 'above forty books and

pursue the freedom to explore 'the force of reason' because of a culture of individualism which had developed in England.[150] This was linked to the growth of capitalism, and Weber briefly explored its geographical basis:

> 'As a result of its insular position [as an island] England was not dependent on a great standing army.' On the continent it was possible for the state to protect its peasantry through its standing army, but in England this was not possible. As a result, England 'became the classical land of peasant eviction. The labour force this threw on the market made possible the development of the domestic small master system ... Thus while in England shop industry arose, so to speak, by itself, on the continent it had to be deliberately cultivated by the state ... This is by no means fortuitous, but is the outcome of continuous development over centuries ... the result of its [England's] insular position.'[151]

Recent Research on Environmental Determinism.

Although environmental determinism and cultural evolutionary theory became unfashionable during the first half of the twentieth century, there has been a significant revival of interest in both these approaches, particularly in the writings of American anthropologists.[152] The most important attempt to revive

---

read over the Bible many times,' but had also read 'above two hundred other books'. P.S. Weaver, *Wallington's World: a Puritan Artisan in Seventeenth Century London*, 1985, p. 5.

[150] See my paper on the sociological basis of the English civil war.

[151] M. Weber, *General Economic History*, 1961, pp. 129, 130; M. Weber, *Theory of Social and Economic Organization*, 1964, p. 277.

[152] For writings on evolutionary theory see L. White, *The Evolution of Culture*, 1959; M.D. Aahlins, E.R. Service (eds.), *Evolution and Culture*, 1960; M.H. Fried, *The Evolution of Political Society*, 1967 and M. Harris, *The Rise of Anthropological Theory*, 1969. For recent publications on environmental determinism see R. Kaplan, *The Revenge of Geography,* 2013; T. Marshall*, Prisoners of Geography*, 2015*;* L. Dartnell*, Origins: How the Earth Shaped Human History*, 2019.

geographical determinism was Julian Steward's work on cultural ecology.[153] There has not yet however been a successful integration of the evolutionary and ecological approaches comparable to the synthesis achieved by biological theory.

There has been a recent resurgence of interest in environmental determinism which has been conveniently summarized and detailed by Wikipdia as follows:

1. Ibn Khaldun has argued that soil, climate, and food determined whether societies were nomadic or sedentary, shaping their customs and ceremonies.[154]
2. Ellen Churchill Semple's case study focused on the Phillipines, where she analysed patterns of civilization and wildness in relation to the topography of its islands.[155]
3. Daron Acemoglu, Simon Johnson and James A. Robinson concluded that geography was the most important influence on institutional development during early state formation. However, they argued that geographic factors cannot directly explain differences in economic growth after 1500 A.D., except through their effects on economic and agricultural productivity.[156]
4. Jeffrey Sachs and John Luke Gallup have examined the role of geography on coastal trade and access to markets, as well as its impact on disease environment and agricultural productivity.[157]

---

[153] J.H. Steward, *Theory of Culture Change*, 1963; M.D. Coe, C.P. Kottak, 'Social typology and tropical forest civilizations', *Comparative Studies in Society and History*, Volume 4, 1961-1962.

[154] See A. Hannoum, *Translation and the Colonial Imaginary: Ibn Khaldun Orientalist*, 2003.

[155] J. Painter, *Political Geography: an Introduction to Space and Power*, 2009, p. 177

[156] D. Acemoglu, J. Robinson, *Why Nations Fail: The Origins of Power, and Poverty*, 2012.

[157] J.D. Gallup, J.D. Sachs, A.D. Mellinger, 'Geography and economic development', *International Regional Science Review,* Volume 22**,** 1999.

5. Jared Diamond has concluded that early states located along the same geographical latitude made it easier for the spread of crops, livestock, and farming techniques. Regions suitable for the cultivation of wheat and barley saw high population densities and the growth of early cities. Resulting writing systems gave people the ability to store and build knowledge. A surplus of food enabled craftsmanship to flourish allowing some groups the freedom to explore and create, which led to the development of metallurgy and advances in technology. The close proximity in which humans and their animals lived led to the spread of disease across Eurasia. Europeans took advantage of their environment to build large and complex states with advanced technology and weapons. The Incas and other native groups in South America did not have these advantages, and suffered from a north-south orientation that prevented the flow of goods and knowledge across the continent.[158]
6. Dr Marcella Alsan argued that the prevalence of the tsetse fly hampered early state formation in Africa. Because the tsetse virus was lethal to cows and horses, communities afflicted by the insect could not rely of agricultural benefits provided by livestock. The disease environment hindered the formation of farming communities, and as a result, early African societies resembled small hunter-gatherer societies rather than centralized states.[159]
7. Stanley Engerman and Kenneth Sokoloff examined the economic development of the Americas during colonization. Specific factor endowments in each colony affected their growth. The development of economic institutions, such as plantations, was caused by the need for a large amount of land and a labour force capable of harvesting sugar and tobacco, while smallholder farms thrived in areas where large scale economies were not suitable for the environment. They

[158] J. Diamond, *Guns, Germs and Steel*, 1997.
[159] See M. Alsan, 'The effect of the tsetse fly on African development', *American Economic Review*, Volume 105, 2015.]

also found smallholder economies to be more equitable since they discouraged an elite class forming, and distributed political power democratically to most land-owning males. Colonies with educated and free populations were better suited to take advantage of technological change during the industrial revolution, granting country wide participation into the booming free-market economy.[160]

8. Historians have also noted that population densities seem to concentrate on coastlines and that states with large coasts benefit from higher average incomes compared to landlocked countries. Coastal living has proven advantageous for centuries as civilizations relied on the coastline and waterways for trade, irrigation, and as a food source. However, factors including fertile soil, nearby rivers, and ecological systems suited for rice or wheat cultivation can give way to dense inland populations.[161]
9. Nathan Nunn and Diego Puga note that rugged terrain usually makes farming difficult, prevents travel, and limits societal growth. Harsh terrain hampered the flow of trade goods and decreased crop availability, while isolating communities from developing knowledge and capital growth. However, harsh terrain had positive effects on some African communities by protecting them from the slave trade. Communities that were located in areas with rugged features could successfully hide from slave traders and protect their homes from being destroyed.[162]
10. Locations with hot tropical climates often suffer underdevelopment due to low fertility of soils, excessive plant transpiration, ecological conditions favouring infectious diseases, and unreliable water supply. These factors can

---

[160] S. Engerman, K. Sokoloff,, *Economic Developments in the Americas since 1500: Endowments and Institutions*, 2011.

[161] J.D. Gallup, J.D. Sachs, A.D. Mellinger, 'Geography and economic development', *International Regional Science*, 22, 1999.

[162] N. Nunn, D. Puga, 'Ruggedness: The blessing of bad geography in Africa', *The Review of Economics and Statistics*, Volume 94, 2012

cause tropical zones to suffer 30% to 50% decrease in productivity relative to temperate climate zones.[163]

Conclusion

There are a number of critical questions which can be asked of Weber's argument about the social process of the development of freedom and rationality which are beyond the scope of this paper. In conclusion however, it is necessary to point out that Weber's analysis lacked depth in certain areas because of the neglect of the details of what might be termed the 'materialistic' dimension. Not only did he fail to discuss in detail the effect of geographical environments on social structure and cultures, but he also neglected the analysis of the most important factor in the evolution of culture: the development of technology.[164] His methodological idealism did however allow him to develop an analysis of the process of intellectual rationalization. His great achievement was to establish the cultural conditions necessary for freedom and the development of rationality, and the psychological consequences of the process of rationalization which led to a sublimated ethic of work. However, he only hinted at the links between geographical environment and economic and political structures and their impact on cultural development.

Weber's emphasis on freedom is consistent with the growth of capitalism, which occurred particularly in England, Holland and elsewhere where there was an absence of major political constraints. This occurred as a result of environmental

---

[163] Gallup, Sachs, Mellinger, 'Geography'; W. Easterly, R. Levine, 'Tropics, germs, and crops: how endowments influence economic development', *Journal of Monetary Economics,* Volume 50, 2003.]

[164] Weber did however analyze in some detail the development of economically more rational forms of social organization. He correctly saw the process of bureaucratization as a form of 'social technology'. For Weber's belief in the inevitable evolution of society towards a structure built on 'mechanized foundations' see Mayer, *Max Weber*, pp. 126, 127.

factors which hampered the growth of standing armies, with a reliance on navies and militias for defence. Weber's methodological idealism was probably responsible for his relative neglect of the role of material and geographical conditions. However, he laid the groundwork for the further scientific work necessary for answering the fundamental question as to why the process of rationalization first occurred in the occident than elsewhere.

Chapter 4: A Sociological Analysis of the English Civil War.[165]

Geography and the Civil War in England.

England experienced the growth of capitalism earlier than most European powers, which along with the prevalence of individual freedom, is central for an understanding of the civil war. Luciani Pellicani in his discussion of the history of capitalism, has emphasized the importance of political and military constraints on personal freedom:

> The *consumer's freedom* is as essential for the functioning of capitalism as the *entrepreneur's freedom* ... The emancipation of the urban communities marks the beginning of the genesis of modern capitalism. Its roots are political and military, not economic. Cities were able to inject dynamism and rationality into the stagnant rural world only to the extent to which they succeeded in withdrawing from the effective jurisdiction of their lords and the spiritual control of economic obscurantism centred around the condemnation of profit and trade. They were successful precisely because they were opposed by a crumbling public power, lacking as never before the military and financial means to compel its subjects to obedience.[166]

Max Weber gave several reasons why England differed from continental powers: 'As a result of its insular position [as an island] England was not dependent on a great standing army.' On the continent it was possible for the state to protect its peasantry through its standing army, but in England this was not possible. As a result, England 'became the classical land of peasant eviction. The labour force this threw on the market made possible the development of the domestic small master system ... Thus while in England shop industry arose, so to speak, by itself,

---

[165] Unpublished paper.

[166] L. Pellicani, *The Genisis of Capitalism and the Origins of Modernity*, 1994, pp. 10, 123.

on the continent it had to be deliberately cultivated by the state ... This is by no means fortuitous, but is the outcome of continuous development over centuries ... the result of its [England's] insular position.'[167]

The argument that these changes occurred as a result of 'a continuous development over centuries' is consistent with Alan Macfarlane's thesis that 'the majority of ordinary people in England from at least the thirteenth century were rampant individualists, highly mobile both geographically and socially, economically "rational", market-oriented and acquisitive, ego-centred in kinship and social life.'[168] This indicates that English individualism existed well before the late fifteenth century, which is when most historians have dated the emergence of capitalism in England.[169] This suggests that something fundamental in English society – 'its insular position' – was responsible for this cultural development.

England's geographical situation as an island meant that it was relatively free from the wars occurring on the continent, relying mainly on a navy for defence and resulting in periodic recruitment of militias rather than the establishment of a permanent army. France, Germany and most continental powers were vulnerable to military attack because of the threat from other land based societies, and therefore were forced to develop armies in order to survive. According to Jane Whittle

> The lack of prosperity [in France was due to] ... the wars conducted on French soil from the fourteenth to the sixteenth centuries, and the heavy royal taxation to which French peasants were subjected from the late fifteenth century onwards ... That English peasants were not subjected to a similar level of taxation was not a matter of chance. There were rebellions against taxation in 1489, and 1497 and 1525, as well as 1381 ... Yet because of the low level of taxation, English

[167] M. Weber, *General Economic History*, 1961, pp. 129, 130; M. Weber, *Theory of Social and Economic Organization*, 1964, p. 277.
[168] A. Macfarlane, *The Origins of English Individualism*, 1978, p. 163.
[169] Ibid, pp. 34-48.

governments could not afford to keep a standing army to put down these rebellions.[170]

Whittle does not explain the relative success of rebellions in England, and why it was so difficult to suppress them. The absence of a permanent national army was the result of England's geographical position as an island, not allowing it as in France, to introduce high taxes. This resulted in a vicious circle: no standing army, low taxation, no standing army.

The exceptions to the vulnerability of continental powers were Holland and Venice, which were protected from attack by their geographical location. In the case of Holland, the canals and marshes allowed them to create flood barriers against enemies, and they established a Water Line in the early seventeenth century which was used to almost transform Holland at times into an island. The Water Line was used for example in 1672, where it prevented the armies of Louis XIV from conquering Holland.[171] Venetian power was derived from its fleet and linked military forces, and its control of its lagoons provided protection from military attacks.[172] It is perhaps no accident that both states became republics with early forms of capitalist development,[173] illustrating Pellicani's thesis about the centrality of military and political factors in creating the freedoms necessary for entrepreneurial growth.

The lack of a permanent national army in England meant that the English crown, as well as the aristocracy, was dependent on the population at large for the creation of military force.[174] This absence of a standing army made it difficult for the government to impose taxes, and eventually resulted in the development of markets relatively free of political and military

---

[170] J. Whittle, *The Development of Agrarian Capitalism: Land and Labour in Norfolk 1440-1580*, 2000, pp. 18, 19, 311.
[171] Wikipedia: *Dutch Water Line.*
[172] Wikipedia, *Military History of the Republic of Venice.*
[173] See M. Lincoln, *London and the 17th Century*, p. 134.
[174] Ibid, pp. xvii-xx, 3-37.

control. England's reliance on its navy for defence included its merchant fleet – and this partly explains its active involvement in world trade, an important dimension in the growth of English capitalism.

There were also important internal geographical factors associated with the development of capitalism in England. It was a country with plentiful coal and iron deposits, internal rivers and good coastal harbours, and a location between Europe and the Americas. However, there were internal environmental conditions which also facilitated the growth of individual freedoms:

> ... [there was] a growing distinction between working communities in forest and in fielden areas. In the nucleated villages characteristic of the latter ... manorial customs [were] fairly rigid, political habits comparatively orderly, and the labourer's outlook deeply imbued with the prevalent preconceptions of church and manor-house. In these fielden areas labourers often ... more or less freely [accepted] their dependence on squire and parson ... In the isolated hamlets characteristic of forest settlements ... the customs of the manor were sometimes vague or difficult to enforce ... and the authority of church and manor house seemed remote. In these areas [the population was] ... more prone to pick up new ways and ideas. It was primarily in heath and forest areas ... that the vagrant religion of the Independents found a footing in rural communities.'[175]

The areas outside of manorial control consisted 'mainly of towns, the pasture and woodland areas linked to an expanding

---

[175] A. Everitt, 'The marketing of agricultural produce' in J. Thirsk (ed.), *The Agrarian History of England and Wales, 1500-1640*, 1967, pp. 462, 463. See also the discussion of the contrast between pastoral and arable areas in D. Underdown, *Revel, Riot and Rebellion: Popular Politics and Culture in England 1603-1660*, 1987, p. 5; J. Thirsk, 'The farming regions of England' in Thirsk, *The Agrarian History*, p. 14; K. Wrightson, *English Society, 1580-1680,* 1982, p. 171; S.B. Jennings, *The Gathering of the Elect: The Development, Nature and Socio-Economic Structures of Protestant Religious Dissent in Seventeenth Century Nottinghamshire.* (D.Phil. Thesis, Nottingham Trent University), p. 270.

market economy, and the industrializing regions devoted to cloth-making, mining, and metal-working ...'[176] Many of these districts were 'perceived as being lawless ... Few gentry families lived there to supervise the behaviour of the "common" people and ... [they] proved to be one of the areas of considerable religious independence and dissent.'[177]

Given the importance of the cloth industry in England, the support of clothing districts for parliament was a key factor in the civil war.[178] The attempts at political control by Charles I extended to the power of the guilds, which were seen by him, along with monopolies, as 'one of the traditional instruments of industrial control'.[179] However, much economic development took place in rural areas, where the power of the guilds was progressively weakened:

> ... during the thirteenth century there was an increasing shift of industry away from urban areas to the countryside ... The growth of the rural cloth industry was partly enabled ... by a rural location ... [which] permitted cloth producers to take advantage of cheap labour away from the prohibitive restrictions of the guilds ... the very existence of craft guilds or endeavours to establish them might encourage merchants to transfer their entrepreneurial activities to the countryside. Textile skills were traditional there and rural overpopulation made labour available ... [180]

---

[176] Underdown, *Revel*, p. 18.
[177] Jennings, *The Gathering,* p. 17.
[178] Underdown, *Revel*, pp. 220, 231-32, 275-78; J. Morrill, *The Nature of the English Revolution,* 1993, p. 235.
[179] R. Ashton, 'Charles I and the City', in F.J. Fisher (ed.), *Essays in the Economic and Social History of Tudor and Stuart England*, 1961, p. 145; L. Stone, *Causes of the English Revolution, 1529-1642*, 1986, p. 126
[180] P.T.H. Unwin, 'Town and trade 1066-1500' in R.A. Dodgson, R.A. Butlin (eds.)*, A Historical Geography of England and Wales*, 1978, p. 136.

The Role of Armies on the Political Development of France and England.

In order to fully understand the civil war in England it is necessary to compare it with events in France during the sixteenth and seventeenth centuries. The French 'Wars of Religion' were a period of war between Catholics and Huguenots in France in the latter half of the sixteenth century. This included the destruction of images in Catholic churches, which resulted in Catholics attacking Protestants, including the St. Bartholomew's Day Massacre in 1572.

Correlli Barnet contrasted the military developments in England, France and Germany during the sixteenth and seventeenth centuries as follows:

> An army had indeed been 'standing' in France almost continuously throughout the sixteenth century; an emergency force to meet continuous emergency. Since 1569 there had been permanent regiments of native-born infantry. France's rise to greatness as a modern military power dates, however, from about 1624, during Cardinal Richelieu's administration ... In 1628 the twelve oldest regiments were given a permanent status ... By 1635, when France entered the war [the Thirty Years War], she had five field armies numbering 100,000 men, including 18,000 horsemen ... Men were now to be paid not by their captains but by state commissioners, one per regiment ... In France under Louis XIII and Richelieu royal authority rested on the army – in the 1630s and 1640s taxes were even collected by armed force. In Germany, where some states enjoyed greater formal powers than the English Houses of Parliament, the princes could plead the emergency of the Thirty Years War to make a convincing case for emergency taxation on royal authority and for raising standing armies ... [181]

Fourteen regiments of the French Army were used to persecute the Huguenots, the major Protestant group in France. Louis XIV

[181] C. Barnett, *Britain and Her Army, 1509-1970*, 1970, pp. 69-73.

instituted a campaign of harassment, which included the occupation and looting of Huguenot homes by military troops, attempting to forcibly convert them. In 1685, he issued the Edict of Fontainebleau, revoking the Edict of Nantes and declaring Protestantism illegal. Huguenots made up to as much as ten per cent of the French population; but by 1685 it had reduced to no more than 1,500 people.[182]

The impact of the suppression of the Huguenots and the control of French society by the military has been summarized by Hatton:

> the monarchy followed the policy of state support, regulation and economic control ... To live nobly, in other words in the manner of the nobility, idly without following a trade or craft, was in itself a claim to honour and social esteem. Colbert and his contemporaries did not realise the advantages which would derive from a general system of freedom of labour.[183]

The incidence of taxation was very high in France, but by contrast the level of taxation in England before the civil war resulted in the emergence of an independent group of prosperous yeomen, artisans and traders.[184] The presence of royal troops in France led to the decimation of the rural population, described by Sir John Fortescue in an account written as early as the 1460s, and summarized by Perry Anderson as follows:

> ... Sir John Fortescue, Lord Chancellor to King Henry VI, fled into France with Henry in 1461 and during the next ten years of exile he wrote his *Learned Commendation of the Politique Laws of England* ... Fortescue noted the oppressions of the rural population by royal troops in France ... 'so that there is not the least village there free from this miserable calamity, but that it is once or twice every year beggared by this kind of pilings (pillage).' This and other exactions,

---

[182] Wikipedia Huguenot.

[183] R. Hatton (ed.), *Louis XIV and Absolutism*, 1976, pp. 227, 240.

[184] T.H. Aston and C.H.E. Philpin, *The Brenner Debate: Agrarian Class Structure and Economic Development in Pre-Industrial Europe*, 1987, p. 89.

> such as the salt tax, led to great poverty of the rural inhabitants which Fortescue observed around him ... In England, on the other hand, the position of rural inhabitants was very different. The absence of heavy taxation, of billeted soldiers, and of internal taxes, meant that 'every inhabiter of that realm useth and enjoyeth at his pleasure all the fruits that his land or cattle beareth, with all the profits and commodities which by his own travail, or by the labour of others he gaineth by land or by water ...' Neither are they sued in the law, but only before ordinary judges, whereby the laws of the land they are justly intreated.[185]

A similar account was given by John Aylmer, later Bishop of London, who lived in exile on the continent and in 1559 published a pamphlet entitled *An Harborowe for Faithfull and Trewe Subjects*. He claimed that the impoverishment of the rural French population was due to the frequency of wars – 'as they are never without it' – resulting in the king's soldiers entering 'the poor man's house, eatheth and drinketh up all that he ever hath'.[186]

Correlli Barnett has summarized the role of the army on political developments in England during the outbreak of the civil war:

> In England ... Charles I endeavoured from 1629 to free himself from the Commons' control over taxation by virtually abandoning any foreign policy, with all its implications in terms of costly armies. However, he could not then plead national emergency to raise an army. The Commons were well aware of the danger to their position which a royal army would represent ... No funds were available to pay an army ... Charles had nothing except the militia system ... [187]

As a result of an absence of a permanent national army, Charles was unable to arrest the rebellious five Members of Parliament, precipitating the civil war. Thomas May's two publications,

---

[185] P. Anderson, *Lineages of the Absolute State*, 1974, pp. 179-181.
[186] Ibid, p. 178.
[187] Barnett, *Britain and Her Army*, pp. 69-73.

issued in 1647 and 1650 ... [claimed] 'what the parliamentarians were defending, as they saw it, was the ancient constitution, the common law which had existed (so Coke said) since time immemorial, and the rights and liberties of all free-born Englishmen,'[188] which Levellers and other radicals believed had been subverted by the Norman Conquest. Sir John Strangways writing in the Tower in the 1640s concluded 'that if the gentry were not universally Anglican high-flyers, neither were they supporters of any supposed scheme to establish a despotism on the French model – most of the Cavalier gentry were as attached to the liberties of the ancient constitution as their old enemies had been.'[189] This emphasis on civil liberties rather than religion was confirmed by Cromwell when he said that at the beginning of the civil war 'religion was not the thing first contended for, but God hath brought it to that issue at last.'[190]

The Political History of London.

The City of London was by far the biggest urban area in England, and became one of the largest cities in Europe. It was the capital of a major sea power, and through its trade had grown immensely powerful. This was illustrated by the Venetian ambassador when he 'reckoned that twenty thousand craft, small and great, were to be seen from London in a day.'[191]

It was relatively immune from the control of the monarchy because of the crown's lack of a standing army. Also, its inland geographical location in the Thames gave it a degree of protection from outside invaders. Its population had grown rapidly during the late sixteenth and seventeenth centuries, reflecting its commercial and financial success and growth.

---

[188] R. Richardson, *The Debate on the English Revolution*, 1998, p.15.
[189] Underdown, *A Freeborn*, p. 115. See also H. Perkin, *The Origins of Modern English Society, 1780-1880*, 1969, pp. 52, 53.
[190] Morrill, *The Nature*, p. 394.
[191] C.V. Wedgwood, *The King's Peace, 1637-1641*, 2001, p. 30.

Table 1: Estimated Population Size of London, 1520-1700.[192]

Approximate Date	Estimated Population of London	Period	Estimated Population of England	London's Population as a Proportion of England's Population
1520	55,000		2,600,000	2.1%
1600	200,000	1520-1600	4,300,000	4.7%
1650	400,000	1600-1650	5,250,000	7.6%
1700	575,000	1650-1700	5,100,000	11.3%

In 1650 towns with a population of over 10,000 numbered a total of 494,000 people in England, of which about 400,000 – 81% – were living in London.[193] This indicates the overwhelming importance of London in the civil war, dominating the urban landscape and its support for parliament.

Historically, London had formed the centre of opposition to the crown's attempts to control the country through its use of the prerogative. As early as the tenth century the City resisted the invasion of the Danes through its defensive fortifications and its military power:[194] Later in the twelfth century Fitz-Stephen described in some detail the military strength of London:

> ... the city mustered, according to estimation, no less than sixty-thousand foot and twenty thousand horse ... the city was possessed of very considerable military strength, the only efficient source of power in those days ... its wall was strong and lofty, adorned with seven gates, and having all along the north side turrets at equally

[192] P. Razzell, C. Spence, 'The history of infant, child and adult mortality in London, 1550-1850', *London Journal,* Volume 32, p. 25.
[193] M. Anderson (ed.), *British Population History*, 1996, p. 122.
[194] G. Norton, *Commentaries on the History, Constitution and Chartered Franchises of the City of London*, 1829, p. 29.

distances. Within it and its immediate suburbs were ... one hundred and twenty-six parish churches.[195]

London formed alliances with barons and others in conflict with the crown, but also supported the crown on occasions, and because of its financial and military power this formed the basis of the City's relative independence and autonomy.[196]

Under a Royal Charter of 1067 the crown had granted London certain rights and privileges, which were confirmed by Magna Carter. These privileges were given on the basis of loans and taxes that the City granted to the crown. However this charter and later ones were frequently abolished by the crown, often requiring major loans and taxes in order to obtain renewals.[197]

The Role of London in the Civil War

London was seen by contemporaries during the civil war as the chief centre of resistance to the crown. Clarendon called London 'the sink of the ill-humours of this kingdom',[198] and a royalist writer declared: 'If (posterity) should ask who would have pulled the crown from the King's head, taken the government off the hinges, dissolved Monarchy, enslaved the laws, and ruined their country; say, 'twas the proud, unthankful, schismatical, rebellious, bloody City of London.'[199] The Venetian ambassador in one of his summaries of events in the civil war claimed 'London was the chief and most determined hot bed of the war against the King. Countless treasure was poured out of the purses

---

[195] Ibid, pp, 76, 83.
[196] Ibid, pp. 75, 156, 158, 204, 211.
[197] Ibid, pp. 70, 96, 97, 115, 156, 157, 282.
[198] V. Pearl, *London and the Outbreak of the Puritan Revolution: City Government and National Politics, 1625-43,* 1961, p. xi; see also T. Hobbes, *English Works,* Volume VI, 1839-45, pp. 191-92.
[199] Pearl, *London,* p. xi.

of private individuals for the support of their armies. The goldsmiths alone are creditors for a loan of 800,000 crowns made to Parliament ...'[200]

At the beginning of the civil war, the Earl of Holland told London's aldermen that 'Your City is the strength of the Kingdom indeed; it is not only the life, but the soule of it; if they [the royalists] can destroy you here, the rest of the Kingdom must all submit and yield.'[201]

London was the biggest manufacturing centre of England during the sixteenth and seventeenth centuries, much of it in the suburbs beyond the control of the City authorities:

> From at least the early sixteenth century ... there had been a tendency for domestic industry to establish itself in the suburbs where it was often possible to escape the powers and penalties of the livery Companies. By 1600, nearly all the leatherworkers and makers of felt hats had left the city and were living in Bermondsey, Southwark and Lambeth ... Many of the newer industries of the period were being attracted to the liberties and out-parishes: sugar-refining and glass-making around Stepney and Islington, alum and dye works to the north and east of the city, and copper and brass mills at Isleworth. Large-scale industrial enterprises, such as ship-building at Rotherhithe and Deptford, and brewing in Clerkenwell and Holborn, were also migrating to the suburbs. There were older industries too: brick-and tile-making in the northern outskirts ... clock-making in Holborn and Westminster; bell-founding in Whitechapel; paper-making in Middlesex, while St. Giles, Cripplegate, was crowded with artisans of the weaving, printing and paper-making trades. Thomas Mun, writing in the sixteen-twenties, described the concentration of workers in the silk industry and recalled how in the past thirty-five years, the winding and twisting of imported raw silk, which previously had not more than 300 in the city and suburbs, had

[200] E. and P. Razzell (eds.), *The English Civil War: A Contemporary Account,* Volume 5, 1657-1675*, Relatzione of England by Giovanni Sagredo,* 1656, p. 4.
[201] Lincoln, *London*, p. 106.

> now 'set on work above fourteen thousand souls'. The great majority of these would have been workers in the outskirts of London.[202]

These manufacturing areas included Southwark which had long been an area beyond the control of the City – brothels, bear baiting and illegal theatrical productions[203] – but also attracted unregistered artisans and foreigners who brought with them a range of industrial skills:

> The more the city became the commercial centre of England, the more the actual industries moved beyond the walls. The poorer craftsmen who did not have the money to set up shop within the city, and the 'foreigners' or unfree men – often including aliens – who were not qualified to do so, not having served an apprenticeship, tended to settle in the suburbs. Over such recalcitrant workers the [guild] companies found it difficult to assert any control, even when empowered to do so by statute or charter.[204]

This was partly the result of the growth of London's population, which undermined the capacity of the City authorities to regulate industry in the suburbs.[205] The City authorities attempted to exonerate itself from blame for the disorders in the City, writing to the king that 'many of the trouble-makers, they thought, came from the unregulated and disorderly suburbs' which were beyond their control.[206] The radicalism of the suburbs was displayed in 1647 when the inhabitants of Southwark opened the gates of London Bridge to Fairfax's army, resisting the City's attempt to oppose the New Model Army.[207]

---

[202] Pearl, *London*, p. 16.
[203] Anonymous, *The City Laws Showing the Customes, Franchises, Liberties, Priviledges, and Immunities of the Famous City of London,* 1658.
[204] D.J. Johnson, *Southwark and the City*, 1969, p. 313.
[205] P. Wallis, 'Controlling commodities: search and reconciliation in the early modern livery companies', in I.A. Gadd, P. Wallis (eds.), *Guilds, Society and Economy in London, 1450-1800*, 2002, p. 87.
[206] Pearl, *London*, p. 129.
[207] Ibid, p. 28.

Given London's high mortality rate, much of its growth was fuelled by migration from elsewhere in Britain. One of the best sources for data on migration is apprenticeship records. According to Brian Manning, most apprentices were 'of good parentage' whose families 'lived honestly and thriftily in the country.'[208] Only a minority of apprentices came from London and the cosmopolitan nature of the City meant its population came from all areas of the country and with fathers in all occupational groups.[209] The majority of apprentices were from 'middle sort' backgrounds, and it was this group who provided the main support for parliament in London.[210]

Table 2 Numbers of Occupations and Number from London.[211]

Occupation of Father	*Total Number*	*Fathers Residing in London*	*% Fathers Residing in London*
Gentlemen, Esquires & Clerks	33	2	6%
Yeomen	51	0	0%
Artisans. Tradesmen & Merchants	90	38	42%
Husbandmen & Labourers	26	2	8%
Total	200	42	21%

[208] B. Manning, *Aristocrats, Plebeians and Revolution in England, 1640-1660,* p. 89.
[209] For data on migration patterns of apprentices see Razzell and Spence, 'The history', p. 27. For confirmation of the very high levels of in-migration to London in the seventeenth century see V.B. Elliott, *Mobility and Marriage in Pre-Industrial England*, Cambridge University Ph. D. thesis, 1978.
[210] B. Manning, *The English People and the English Revolution*, 1991.
[211] Data from C. Webb, *London Livery Apprenticeship Registers*, Volumes 2, 33, 43 and 48, tylers & bricklayers, plumbers, vintners, grocers. First 50 cases were selected from each volume, 1640-1660

As C.V. Wedgewood observed: 'In all the larger towns, and above all in London, the short-haired apprentices who thronged about the place counted among their number gentlemen's sons, yeomen's sons, the sons of professional men and of citizens ... all were alike apprentices, and common interests, hopes and pleasures broke down the barriers of inheritance.'[212] This illustrates the importance of social structures in unifying disparate individual differences, an important factor in the communities involved in the civil war.

London was both cosmopolitan in the origins of its residents, but also in its high degree of literacy. Evidence produced by David Cressy indicates that seventy per cent of men in England were unable to sign their names in 1641-42, whereas this was true of only twenty-two percent of Londoners, suggesting 'that the capital may have provided a uniquely literate environment.'[213] This high level of literacy was partly associated with the occupational structure of London, as indicated by Table 3.

Table 3 Social Structure of Illiteracy in the Diocese of London, City and Middlesex, 1580-1700.[214]

Fathers Occupation	Number Sampled	Proportion Signing with a Mark
Clergy & Professionals	168	0%
Gentry	240	2%
Apprentices	33	18%
Tradesmen & Craftsmen	1,398	28%
Yeomen	121	30%
Servants	134	31%
Labourers	7	78%
Husbandmen	132	79%
Women	1,794	76%

[212] Wedgwood, *The King's Peace*, p. 52.
[213] D. Cressy, *Literacy and the Social Order: Reading and Writing in Tudor and Stuart England,* 1980, p. 72; see also P.S. Seaver, *Wallington's World: A Puritan Artisan in Seventeenth Century London*, 1985, p. 5.
[214] Cressy, *Literacy*, p. 121.

There was a significant difference in the high literacy of the gentry, professionals, tradesmen & craftsmen on the one hand – who were in a majority in the sample – and the low literacy of husbandmen, labourers and women on the other.

London not only provided the bulk of the money, supply of weapons, ammunition, uniforms and other military equipment for parliament,[215] but in the early stages of the war also the majority of its soldiers from its trained bands.[216] As Clarendon wrote of the Battle of Edgehill, 'the London train bands, and auxiliary regiments ... behaved themselves to wonder, and were in truth the preservation of that army that day ...'[217] London not only supplied the bulk of the trained parliamentary troops, but also the City was central to the beginning of the war through its participation in mass demonstrations of parliament, as well as creating petitions for political and religious reform.[218] These demonstrations occurred virtually every day, constantly lobbying parliament in a threatening way.[219] The population also demonstrated through its actions its opposition to the crown and support of parliament:

> In a desperate attempt to redeem his abortive coup, Charles went down to the city on 5 January [1642]. 'the people crying 'Privilege of Parliament' by thousands ... shutting up all their shops and standing at their doors with swords and halberds ... the city was now in mortal fear of the king and his cavaliers. A rumour the next evening that Charles intended to fetch out his victims [five Members of Parliament] by force brought huge crowds into the streets, with whatever arms they could lay their hands on: women provided hot

[215] S. Porter, S. Marsh, *The Battle for London*, 2010, p. 41.
[216] J. Morrill (ed.), *Reactions to the English Civil War, 1642-1649,* 1982, p. 19.
[217] E. Hyde, Earl of Clarendon, *The History of the Rebellion and Civil Wars in England Begun in the Year 1641*, Volume 3, 1888, pp. 174, 175.
[218] Fletcher, *The Outbreak*, p. 128; See also R Ashton, *The City and the Court, 1603-1643*, 1979, p. 220.
[219] E. And P. Razzell (eds.), *The English Civil War: A Contemporary Account, Volume 2: 1640-42*, 1996, p. 142.

> water to throw on the invaders, stools, forms and empty tubs were hurled into the streets 'to intercept the horse' ... the truth was dawning in Whitehall, between 4 and 10 January, that, for all their swashbuckling of the cavaliers and the protestations of young loyalists at the Inns of Court, the king had lost control of his capital.[220] The five members ... together with Viscount Mandeville [who the king attempted to arrest], embarked at the Three Cranes ... there was a fleet of boats, armed with muskets and ordnance ... Trumpets, drums and martial music accompanied the MPs all the way to Westminster ... More than 2000 men in arms and citizens thronged Westminster Hall ... [221]

The Venetian ambassador claimed in July 1643 that 'the support of this war rests upon the city alone ... [It] has already usurped practically absolute power. They have formed a council for the militia, composed of citizens with supreme authority to do what is considered necessary for self defence while, for the equipment of the Army and its despatch, they are raising money and men ...'[222] It was the absence of a standing army which led to the failure of Charles I to force parliament to comply with his demands, leading to his failure to arrest the five members in 1642. He was unable to force Londoners to reveal their whereabouts, and London turned out to be the chief centre of resistance to royal control.

The Venetian ambassador argued that the Puritans owed their success in the Short Parliament elections to their achievements in 'Swaying the Common votes', and Thomas Hobbes more or less concurred, asserting that 'tradesmen, in the cities and boroughs ... choose as near as they can, such as are most repugnant to the giving of subsidies'.[223]

---

[220] Fletcher, *The Outbreak*, p. 182.

[221] Ibid, p. 185. See Manning, *Aristocrats*, pp. 34-36 for a discussion of the role of London citizens in support of parliament.

[222] E. And P. Razzell (eds.), *The English Revolution: A Contemporary Study of the English Civil War*, 1999, p. 194.

[223] D. Hirst, *The Representative of the People? Voting in England under the Early Stuarts*, 1975, p. 68. See also Morrill (ed.), *Reactions*, p. 70 for a

This illustrates Pellicani's thesis about the role of towns and urban areas in injecting 'dynamism and rationality into a stagnant rural world', and laying the foundation for parliamentarian opposition to the crown. The Venetian Ambassador on the 24th January 1642 gave a further account of the popular support for parliament in London,[224] and on the 7th November described how the Londoners erected barriers to protect the City against the royalist army: 'There is no street, however little frequented, that is not barricaded with heavy chains, and every post is guarded by numerous squadrons. At the approaches to London they are putting up trenches and small forts of earthwork, at which a great number of people are at work, including the women and little children.'[225] On the 15th May the following year, the ambassador described the completion of these fortifications:

> The forts round this city are now completed and admirably designed. They are now beginning the connecting lines. As they wish to complete these speedily and the circuit is most vast, they have gone through the city with drums beating, the flag flying to enlist men and women volunteers for the work. Although they only give them their bare food, without any pay, there has been an enormous rush of people, even of some rank, who believe they are serving God by assisting in this pious work, as they deem it.[226]

This was a revolutionary moment demonstrating fierce and violent opposition to the crown. This moment has been described in detail by Pearl as follows:

> At the order of the Common Council, pulpits were to resound with the call to defend the city. Ministers were to 'stir up the parishioners' to complete the fortifications with the aid of their children and

discussion of the support of trading cities for parliament and the support of cathedral cities for the crown.

[224] Razzell, *The English Civil War,* Volume 2, 1640-42, p. 169.

[225] Razzell, *The English Revolution*, p. 173.

[226] Ibid, p. 188.

servants ... It is not surprising that Pennington's wife, the Lady Mayoress, was there (armed with an entrenching tool, said a Royalist ballad) – we have already encountered her staunch Puritanism. But ladies of rank were also present, as well as fish wives who had marched from Billingsgate in martial order headed by a symbolic goddess of war ... Columns with drums beating and flags flying were sent through the city to recruit more volunteers until 20,000 persons, it was said, were working without pay, drawing only their rations ... The work was allocated by whole parishes, and different trades and Livery Companies, who marched out with 'roaring drums, flying colours and girded swords': over fifty trades were said to have competed in friendly emulation: one day it was 5,000 Feltmakers and Cappers with their families: the next almost the entire Company of Vintners with their wives, servants and wine-porters; on another, all the 2,000 city porters 'in their white frocks', followed by 4,000 of 5,000 Shoemakers, a like number from St. Giles-the-Fields and thereabouts, and the entire inhabitants of St. Clement Dane. In this astonishing manifestation of unity, even the 'clerks and gentlemen' participated as a profession. Those belonging to Parliament, the Inns of Court, and other public offices, were mustered in the Piazza in Covent Garden at seven o'clock in the morning with 'spades, shovels, pickaxes and other necessaries' Popular enthusiasm for the fortifications could reach no higher pitch. Whatever the military value of the defences, the successful mobilization of a great mass of the ordinary people proved the power of parliamentary puritan organization and leadership ... The city had been united in one desire – London should not become a battlefield.[227]

London also had a major influence on provincial towns and urban areas. Clarendon concluded that the chief opposition to the king lay in 'great towns and corporations ... not only the citizens of London ... but also the greatest part of all other cities and market towns of England.'[228] This was mainly through trading

[227] Pearl, *London*, pp. 264, 265.

[228] Hyde, *The History,* Volume 2, 1888, pp. 226, 238. Hyde was quoting from Hobbes in this account. The Corporation Act passed in 1661 which prevented non-Anglicans from holding office in towns and corporations, is further confirmation of the role of towns in supporting parliament during the civil war.

links, as described by the Puritan clergyman Richard Baxter in his discussion of the support of tradesmen and artisans for parliament: 'The Reasons which the Party themselves gave was, Because (they say) the Tradesmen have a Correspondency with London, and so are grown to be far more Intelligent sort of Men ... '[229] The role of tradesmen in the civil war was confirmed by Parker, in his *Discourse of Ecclesiastical Politie* published in 1671: 'For 'tis notorious that there is not any sort of people so inclinable to seditious practices as the trading part of a nation ... And, if we reflect upon our late miserable distractions, 'tis easy to observe how the quarrel was chiefly hatched in the shops of tradesmen, and cherished by the zeal of prentice-boys and city gossips.'[230]

There was however internal opposition led by royalists in London to the Puritan takeover of the City.[231] On October 24, 1642 the Venetian ambassador wrote:

> In this city a by no means negligible party is disclosing itself in his [the king's] favour, and a goodly number of men, anxious to make themselves known as such by those who inwardly cherish the same laudable sentiments, have introduced the practice, following His Majesty's soldiers, of wearing a rose coloured band on their hats, as a sign that they are his faithful servants. The Mayor, on the other hand, who is a Puritan, whose duty it is to superintend the government of the City, is endeavouring by vigorous demonstrations to prevent the spread of this custom ... [232]

The conflicts sometimes led to violence and the ambassador reported on an affray which took place in St. Paul's Cathedral on the 30th October 1653:

---

[229] R. Baxter, *Reliquiare Baxterianae*, Part 3, 1696, Part 1, p. 30.
[230] C. Hill, E. Dell (eds.), *The Good Old Cause: The English Revolution of 1640-1660, Its Causes, Course and Consequences,* 1969, p. 238. After the restoration, Bishop Hacket claimed that the 'Conveticles in Corporations were the seminaries out of which the warriors against King and Church came.' Stone, *Causes*, p. 103.
[231] Porter and Marsh, *The Battle*, p. 46.
[232] Razzell, *The English Civil War, Volume 2: 1640-42*, p. 312.

> Last Sunday ... a riot took place in St. Paul's Cathedral to the consternation of all present. Among the various sects, of which more than fifty may now be counted in England, that of the Anabaptists which at present numbers many proselytes, had a place assigned it there for preaching purposes ... on the day in question, a considerable mob of apprentices appeared there on a sudden to oust the Anabaptists, whose preacher they began to insult, His followers took his part, but though the military were called in and quelled the tumult, some were killed and others maimed.[233]

But that London was the centre of opposition to the crown was reflected in political affiliation in the post-restoration period. In the 1661 election, it returned to parliament four MPs, two Presbyterians and two Independents.[234] Pepys records a conversation with a Mr Hill on 26th July 1661, telling him that 'the King now would be forced to favour the Presbytery, or the City would leave him.'[235] Later in 1663 Pepys claimed that the royalists were afraid of London and that 'they talk of rebellion, and I perceive they make it their great maxime to be sure to Maister the City of London.'[236] As a result of the fear of the City, in 1683 Charles II suspended the rights and privileges of the corporation, which were only restored by William and Mary in 1689.

Puritanism in the Civil War

---

[233] Razzell, *The English Civil War, Volume 4: 1648-1656*, p. 157. For other accounts of opposition to the radicalism of the sects see K. Lindley, 'London and popular freedom in the 1640s' in R.C. Richardson, G.M Ridden (eds.), *Freedom and the English Revolution*, 1986, pp. 127, 132.

[234] R.C. Thatham, W. Matthews (eds.), *The Diary of Samuel Pepys,* Volume 2, 1995, 20 March 1661, p. 57, fn.

[235] Ibid, p. 141.

[236] Pepys, Volume 4, p. 131.

Religion played a major role in the civil war, although it was not the first issue to provoke parliament in its opposition to the crown.[237] London had been the centre of separatist Puritan congregations from the fourteenth century onwards,[238] and according to Baxter, 'The remnant of the old Separatists and Anabaptists in London was then very small and inconsiderable but they were enough to stir up the younger and inexperienced sort of religious people.'[239] Contact with London influenced opposition to the religious policies of Laud, which was most vocal 'in great clothing towns, because they see no such thing, as they say, in the churches in London.'[240] London's influence on the spread of puritanism occurred through its trading links:

> The growth of puritanism, wrote a hostile critic, was by meanes of the City of London (the nest and seminary of the seditious faction) and by reason of its universall trade throughout the kingdome, with its commodities conveying and deriving this civil contagion to all our cities and corporations, and thereby poisoning whole counties.[241]

London merchants were also responsible for endowing lectureships in their home towns, encouraging the widespread spread of puritanism.[242] Baxter concluded 'that there was [not] in all the World such a City [as London] for Piety, Sobriety and Temperance.'[243]

---

[237] Baxter, *Reliquiare Baxterianae,* p. 18.
[238] M.M. Knappen, *Tudor Puritanism,* 1965, pp. 8, 290; A. Woolrych, 'Puritanism, politics and society', in E.W. Ives (ed.), *The English Revolution, 1600*-60, 1968, p. 53; B. Manning, *The English People and the English Revolution*, 1976, p. 38; H. Barbour, *The Quakers in Puritan England*, 1964, pp. 21, 22.
[239] Woolrych, 'Puritanism', p. 53.
[240] Underdown, *Revel*, p. 78.
[241] R.H. Tawney, *Religion and the Rise of Capitalism*, 1936, pp. 203, 204. See also Hyde, *The History*, Volume 2, p. 226; Hirst, *The Representative*, p. 47.
[242] J.E.C. Hill, 'Puritans in the dark corners of the land', *Transactions of the Royal Historical Society*, 5th Series, Volume 13, 1963, p. 95.
[243] Baxter, *Reliquiare Baxterianae*, Part 3, 1696, p. 17.

Perhaps the essence of puritanism was summarized by Bishop Gardiner in the 1540s: 'They [the Puritans] would have all in talking, they speak so much of preaching, so as all the gates of our senses and ways to man's understanding should be shut up, saving the ear alone.'[244] This was the consequence of a 'rational' rejection of all magic and ritual, described so eloquently by Milton and central to Weber's thesis on the protestant ethic. Puritans placed great emphasis on individual conscience often linked to literacy and the reading of the bible.[245] However, much of puritanism was a reaction to the historical threat from catholicism, and one source noted that John Milton who 'was the oracular poet of the hard-working, godly, mercantile London citizenry, who saw themselves increasingly menaced by papists at court and abroad, and for him and his family and friends, the Gunpowder Plot was both the incarnation of their worst nightmares and solid proof that they were right to be afraid.'[246]

The Puritan reformation often created a hostile reaction among the general population, described by one apologist as the 'weeping and bewailing of the simple sort and especially of women, who going into the churches, and seeing the bare walls, and lacking their golden images, their costly copes, their pleasant organs, their sweet frankinsense, their gilded chalices, their goodly streamers, they lament in themselves and fetch deep sighs and bewail the spoiling and laying waste of the church, as they think.'[247]

By the 1620s Dorchester was in the grip of an authoritarian Puritan regime 'which regulated the most minute details of the residents' lives with fanatical rigour. Swearing, tippling, sexual irregularities, "night walking" absence from church, feasting and merry making, and general idleness: these

[244] M.M. Knappen, *Tudor Puritanism,* 1965, p. 68.
[245] Woolrych, 'Puritanism', p. 87.
[246] D. Purkiss, *The English Civil War: A People's History*, 2007 p. 305.
[247] Ibid, pp. 435, 436.

were the common targets of reformers everywhere.'[248] The clothing industry was notorious for its puritanism and its support for parliament; for example, one contemporary noted that Colchester 'is a raged, factious Towne, and now Swarming in Sectaries. Their Trading Cloth ... '[249]

The bulk of London Puritans were made up of tradesmen and artisans:

> ... depositions of Francis Johnson's separatist congregation in London, when they were arrested in 1593, show that they included six shipwrights, five tailors, four servants, three ministers, three weavers or cloth-workers, three carpenters, three clerks, and scriveners, two fishmongers, two haberdashers, two shoemakers, two purse-makers, a glover, a cup-maker, a goldsmith, a 'scholler', a broad-weaver, an apothecary, a coppersmith, and two schoolmasters. Most were men under thirty-five years old.[250]

This socio-economic group has historically been the core group supporting puritanism, as pointed out by Weber: 'With great regularity we find the most genuine adherents of puritanism among the classes which were rising from a lowly status, the small bourgeois and farmers.'[251] The low status suburbs and some of the liberties very quickly earned a reputation for puritanism and after 1640, for radicalism. In 1642, the inhabitants of the eastern suburbs of London, 'mariners, soldiers, or private persons' petitioned against the removal of their own trained bands from the Tower and the violence which had been used against Puritans.[252] Southwark was another suburb with a radical reputation: 'Here, the tanners, glovers and brewery workers were notorious for lawlessness and sedition. In May

---

[248] Underdown, *Revel*, p. 52.
[249] E.S. De Beer, *The Diary of John Evelyn*, Volume 3, 1955, p. 177.
[250] H. Barbour, *The Quakers in Puritan England*, 1964, pp. 21, 22.
[251] M. Weber, *The Protestant Ethic and the Spirit of Capitalism*, 1930, p.174.
[252] Pearl, *London*, p.40.

1640 ... they joined with the sailors of Bermondsey in a great demonstration against Laud.'[253]

However, during the civil war period, puritanism appealed to a greater range of socio-economic groups:

> To contemporaries the chosen seat of the Puritan spirit seemed to be those classes in society which combined economic independence, education, and a certain decent pride in their status, revealed at once in a determination to live their own lives, without truckling to earthly superiors, and in a somewhat arrogant contempt for those who, either through weakness of character or through economic helplessness, were less resolute, less vigorous and masterful, than themselves. Such ... were some of the gentry. Such, conspicuously were the yeomen, 'mounted on a high spirit, as being slaves to none,' especially in the free-holding counties of the east. Such, above all, were the trading classes of the towns, and of the rural districts which had been partially industrialized by the decentralisation of the textile and iron industries.[254]

The leaders of the Puritan movement in parliament were members of the gentry and aristocracy – John Pym, the Earls of Warwick and Holland, Lords Saye, Lord Brooke and John Hamden – who were shareholders in the Providence Company, a trading company in the Caribbean.[255] In the early period of the civil war parliament attracted great support from the aristocracy and gentry on constitutional and economic grounds.[256]

The influence of puritanism on the support for parliament occurred not only in London, but also elsewhere such as in Lancashire, where the Oliver Heywood noted in his diary:

> Many days of prayer, have I known my father keep among God's people; yea, I remember a whole night wherein he, Dr Bradshaw, Adam Faernside, Thomas Crompton, and several more did pray all

---

[253] Ibid.
[254] Tawney, *Religion*, p. 208.
[255] C.V. Wedgwood, *The King's War, 1641-1647*, 2001, p. 28.
[256] Baxter, *Reliquiare Baxterianae*, pp. 30, 31.

> night in a parlour at Ralph Whittal's, upon occasion of King Charles demanding the five members of the House of Commons. Such a night of prayers, tears, and groans, I was never present at all in my life.[257]

The parliamentary Puritans captured both the City government and its trained bands, so giving parliament its first soldiers. This preceded the king's early departure from Whitehall in January 1642, which prevented a successful counter-revolution in London.[258] There was however resistance to the imposition of Puritan discipline, as illustrated by events in London where many riots were touched off by attempts to suppress popular amusements. There were sporadic outbreaks in London, including an apprentice riot at Christmas 1645, and another in April 1648 when troops broke up a Sunday tip-cat game in Moorfields.[259]

There were also internal divisions within the Protestant movement, which eventually led to serious political conflicts. Presbyterians began to increasingly oppose the radicalism of the Independents, the Baptists and other religious sects which dominated the New Model Army, leading to differences in support for the monarchy. By June 1651 'many English Presbyterians were beginning to opt for monarchy ... A Presbyterian minister rejoicing in the name of Love was arrested in London during May for conspiring on behalf of the king. He and another minister were executed on Tower Hill at the beginning of August as a warning to all other Presbyterians sympathetic to Charles II.'[260]

This conflict between Presbyterians and Independents undermined London's central role in opposition to the crown. These political conflicts were partly the result of differences in socio-economic status:

---

[257] W. Haller, *The Rise of Puritanism*, 1957, pp. 297, 298.
[258] Pearl, *London*, p. 132.
[259] Underdown, *Revel,* p. 261.
[260] Ashley, *The English*, p. 173.

> The general picture conveyed of Presbyterians in Nottinghamshire is of solid, respectable individuals drawn predominantly from the ranks of the 'middling sort'. Over half of the county's Presbyterians lived in the town of Nottingham. This very much reflects both the national and regional picture of Presbyterianism ... as a faith of the 'urban middle class' ... supporters were predominantly drawn from the upper 'middling sorts', minor or pseudo gentry and their servants. The pseudo-gentry consisted of wealthier merchants, lawyers, civil servants and the younger sons of gentry. Though not part of the landed elite, their status as gentlemen and esquires was increasingly recognized throughout the century and their greater wealth distinguished them from the 'middling sorts'.[261]

The variations in social status between the Presbyterians and the more radical sects was reflected in their appearance: 'While the one party retained the close-cropped and ungainly appearance of the Independents in the days of Cromwell, our Presbyterian clergy developed into full periwigs and flowing luxuriance of band and habit which usually characterized persons of their status after the Restoration.'[262]

Of the Nottingham Presbyterians Lucy Hutchinson wrote

> the Presbyterians were more inveterately bitter against the fanatics than even the Cavaliers themselves ... and prayed seditiously in their pulpits and began openly to desire the king, not for good will to him, but only for the destruction of all the fanatics. In 1660, a confrontation occurred in Nottingham between the young men of the town who were demonstrating for the return of the King, and soldiers of Colonel Hacker's regiment ... Charles II's Declaration at Breda in 1660, which promised to allow a 'measure of religious liberty to tender consciences', encouraged many Presbyterians to actively campaign for his return.[263]

---

[261] Jennings, *The Gathering*, p. 244

[262] C.E. Whiting, *Studies in English Puritanism*, 1931, p. 44; Jennings, *The Gathering*, p. 244.

[263] Jennings, *The Gathering*, p. 160.

After the restoration settlement, the Puritan aristocracy and gentry abandoned religious dissent, which became dominated by the middle sort.[264] The middle classes were too influential to allow the eclipse of dissent, which eventually became embedded in English society.[265] The Compton Census of 1676 confirmed that dissenters were 'mostly found in towns with a strong puritan tradition, in centres of the cloth industry, and in places where the social and residential structures created conditions favourable to religious individualism.'[266]

Richard Baxter's Account of the Civil War

Richard Baxter, although a Puritan minister who had served in the New Model Army, was nearest to a contemporary with the most sociological understanding of the civil war. He summarized the role of religion as follows:

> ... the generality of the People through the Land (I say not *all* or every *one*) who were then called Puritans, Precisions, Religious Persons ... and speak against Swearing, Cursing, Drunkeness, Prophaness etc. I say, the main body of this sort of Men, both Preachers and People, adhered to Parliament. And on the other side, the Gentry that were not so precise and strict against an Oath, or Gaming, or Plays, or Drinking, nor troubled themselves so much about the Matter of God and the World to come, and the Ministers and People that were for the King's Book, for Dancing and Recreation on the Lord's Days ... the main Body of these were against the Parliament.[267]

Baxter elaborated on this analysis by stating that 'though it must be confessed that the public safety and liberty wrought very

---

[264] H. Perkin, *The Origins of Modern English Society, 1780-1880*, 1969, pp. 34, 42.
[265] Ibid; Jennings, *The Gathering*, p. 278
[266] Underdown, *A Freeborn*, pp. 120, 121.
[267] Baxter, *Reliquiare Baxterianae*, Part 1, pp. 30, 31.

much with most, especially the nobility and gentry who adhered to Parliament, yet it was principally the difference about religion that filled up the Parliament's armies and put the resolution and valour into their soldiers, which carried them on in another manner than mercenary soldiers are carried on.'[268] On the other side it was the 'ignorant rabble [who] are everywhere the greatest enemies against Godly ministers and people ... the Tinkers and Sowgaters and water carriers and beggars and bargemen and all the rabble that cannot reade, nor even use, the bible.'[269]

He described the puritanism of artisans, particularly weavers, who were literate and read the bible and other religious works, and how the occupational structure of Kidderminster aided his evangelism.

> A weaver or a Shoemaker or a Taylor can worke without the wetting or tiring his body, and can thinke and talke of the concerns of his soule without impediment to his labour. I have known many [at Kidderminster] that weave in the Long Loome that can set their sermon notes or a good book before them and read and discourse together for mutual edification while they worke. But the poor husbandman can seldom do ... Another help to my Success was, that my People were not *Rich:* There were among them very few *Beggars*, because their common Trade of Stuff-weaving would find work for all, Men, Women and Children, that were able ... The Magistrates of the Town were few of them worth 40 £ *per* An. ... The generality of the Master Workmen, lived but a little better than their Journey-men, (from hand to mouth) ... [270]

Baxter further elaborated the influence of socio-economic status on religious and political affiliation.

> And, which I speak with griefe, except here and there one (of the richer sort mostly that are not pincht with the necessity of others)

---

[268] Quoted in Woolrych, 'Puritanism', pp. 93, 94.
[269] R. Baxter, *The Poor Husbandman's Advocate to Rich Racking Landlords*, 1926, p. 24.
[270] Ibid, p. 26; Baxter, *Reliquiare Baxterianae*, Part 1, p. 94.

> there is more ignorance of religion among them than among tradesmen and corporation inhabitants and poore men of manuall artificers. And yet they are not usually guilty of the sins of Gluttony, fornication or adultery, so much as rich citizens and great men's full and idle serving men ... But among merchants, mercers, drapers and other corporation tradesmen, and among weavers, taylors, and such like labourers, yea among poore naylors, and such like, there is usually found more knowledge & religion than among the poor enslaved husbandman. I may well say *enslaved*: for more are so servilely dependent (save household servants and ambitious expectants) as they are on their landlords. They dare not displease them lest they turn them out of their houses; or increase their rents. I believe the Great Landlords have more command of them than the King hath. If a Landlord be but malignant, and enemy to piety or sobriety or peace, his enslaved tenants are at his beck to serve him, in matters of any publike consequence.[271]

He wrote approvingly in 1673 of the presence 'in most places' of 'a sober sort of men of the middle rank, that ... are more equal to religion than the highest or lowest usually are ...'[272] Another Puritan, Nehemiah Wallington, in 1650 anticipated Wesley in his argument about the link between wealth and religious sobriety. He lamented that the 'great change in some men, for ... when they in mean condition, they were humble, and they were for God, but now they be rich ... [they have purchased] brave houses, fine apparel, or belly cheer, when the poor saints have perished in want.'[273]

The authority of a landowner over his employees continued to exist well into the nineteenth century and was illustrated by an account in a local Hertfordshire autobiography as follows:

> Every worshipper had to wait outside [the church] until the squire had walked to the widening of the path and had made that dramatic

[271] Baxter, *The Poor Husbandman's*, p. 27.
[272] J. Barry, C. Brooks (eds.), *The Middling Sort of People: Culture, Society and Politics in England, 1550-1800*, 1994, p. 48.
[273] Seaver, *Wallington's World*, p. 129.

> flourish when he pulled out his gold watch and looked up at the church clock. When he was satisfied that the clock had not dared to contradict the time on his watch he would nod to the clock, smile at the admiring people, and hold out his hand to the vicar standing in the doorway to welcome him. Then the bells would ring merrily and then the other direction the staff of another big house marched to the church: the housekeeper and butler in front, two footmen next then about fourteen girls walking in pairs. They were paraded to church every Sunday, but were only allowed one free evening a month.[274]

By this period deference no longer had such a powerful hold as it did in the seventeenth century:

> We paid three pounds an acre for our land [in Hertfordshire], and looked over fences at land held by big farmers for seventeen and sixpence an acre ... My father once asked a gentlemen farmer to rent him a piece of ground ... He was given a definite refusal: 'Certainly not' ... Some months later the same gentleman stopped my father and said, 'I suppose you have heard that I am standing at the next election. We've been neighbours for some years. Can I count on your vote?' It was not my father's way to avoid the truth. 'Certainly not', he replied; 'my vote is the most valuable thing I have got ...'[275]

The Role of the Navy.

Protestantism became embedded in the navy, partly as a result of the historical reaction against the threat from Catholic powers, particularly from Spain. This often took the form of Puritan worship:

> When Drake set sail from Plymouth on November 15, 1577, on the voyage that was to take him around the world, he carried for the instruction of his men Bibles, prayer books, and Foxe's Book of Martyrs, and had, for chaplain, one Francis Fletcher ... Routine

[274] B.L. Coombes, *These Poor Hands: The Autobiography of a Miner Working in South Wales,* 2012. [First published in 1939], pp. 5, 6.
[275] Ibid, p. 4.

> religious duties were as rigorously enforced as any other discipline of the ship, and in times of crisis the commander prescribed special religious exercises.[276]

This emphasis on worship also applied to private navies such as those of the East India Company. The Company 'saw to it that ships were amply provided with edifying reading matter. The essentials were a Bible and a Book of Common Prayer, John Foxe's *Book of Martyrs*'[277] and on 'the rare occasions when a ship's commander failed in his religious responsibilities, he was subject of complaints, not only from the chaplains but from the seamen themselves.'[278] The religious radicalism of mariners was sometimes found outside London. For example 'a gang of seamen battered down the images and glass of Rochester Cathedral, and destroyed the cherished library accumulated by the poet Dean Henry King.'[279]

This radicalism led to the participation of ordinary seamen in religious and political protests against the crown's attempt to suppress parliament:

> When ... the Five Members returned to Westminster, some 2,000 sailors accompanied them, and their participation was explained in the anonymous *The Seamans Protestation Concerning their Ebbing and Flowing to ... Westminster.* The pamphlet maintained that the sailors had not been summoned but came 'of our own free voluntarie disposition ... as well to protect *White-hall* ... ' This publication too, blamed 'Papists' as the enemy, and concluded with an oath supposedly sworn by the mariners, closely modelled on Parliament's Protestation oath.[280]

---

[276] L.B. Wright, *Religion and Empire: The Alliance between Piety and Commerce in English Expansion, 1558-1625*, 1943, p. 1.
[277] Ibid, p. 71.
[278] Ibid, p. 68.
[279] Wedgwood, *The King's War*, p. 124.
[280] R.J. Blakemore, E. Murphy, *The British Civil Wars at Sea, 1638-1653*, 2018, p. 47.

Had the king held the fleet, it would have created major problems for parliament. He would have been able to blockade the Thames, starving London of trade, food and fuel. Such an outcome would probably have led to a major loss of support for parliament, changing the course of the civil war.[281]

Mariners lived in communities on both sides of the Thames, along the shipyards in Wapping, Shadwell, Limehouse, Rotherhithe and Southwark. [282] St Dunstans's Stepney, was one of the most staunchly protestant in London. This was partly because its congregation included a high proportion of Huguenot refugees.[283]

These areas also contained the artisans and tradesmen living in the suburbs, and they formed with the mariners the crowds who had lobbied and petitioned parliament for radical political and religious reform. [284] Much of the political and religious divide which shaped the civil war was based on communities which cut across individual differences of support, providing socially structured action groups.

Parliament's control of the navy was brought about by the Earl of Warwick who seized it in 1642, with only two captains refusing to surrender their ships.[285] The gentlemen commanders who had dominated the navy before the civil war were replaced by men who had been active in popular radical politics.[286] According to Bernard Capp only 20 of the 319 officers appointed by the Commonwealth and Protectorate, came from the gentry, mostly from younger branches which had gone into trade.[287]

Parliament used the navy to land forces and blockade ports held by the royalists, which played an important role in

---

[281] M.J. Lea-O'Mahoney, *The Navy in the English Civil War* (D.Phil. University of Exeter, 2011), p. 8.
[282] Wedgwood, *The King's Peace*, p. 29.
[283] Purkiss, *The English*, pp. 41, 42.
[284] C.V. Wedgwood, *The King's War, 1641-1647*, 1983, p. 61; Purkiss, *The English*, p. 470.
[285] Wedgwood, *The King's War,* p. 105.
[286] Blakemore and Murphy, *The British*, p. 95.
[287] R. Hutton, *The British Republic 1649-1660*, 2000, p. 12.

winning the civil war.[288] The navy also ensured that weapons could be imported from abroad – by 4 October 1642 these included 5,580 pikes, 2,690 muskets, 980 pairs of pistols, 246 carbines and 3,788 sets of armour.[289] Warwick's sailors – approximately 3,000 strong – were also organized into two regiments and played an important part in parliament's victory.[290] However, after the polarisation of the opposition into Presbyterian and Independent factions in 1648, there was a significant defection of ships and mariners from the parliamentary cause.[291]

Socio-Economic Status and the Civil War

An analysis of the socio-economic status of participants in the civil war is fraught with difficulty. Information on the elites is relatively easy to obtain, but data on rank-and-file members of political and religious groups is largely lacking.[292] Although statistical analysis is virtually impossible, literary evidence is abundant but often very partisan given the nature of the civil war. However, by adopting the principle of triangulation which uses sources from both sides of the conflict, it is possible to achieve a degree of consensus.

There is also the difficulty of significant changes in the adherents to parliament and the crown, so that for example more than two-fifths of the Commons and the majority of the Lords left Westminster for the king's cause in 1642.[293] Also there were major changes in the social structure of England during the

---

[288] Blakemore and Murphy, *The British*, p. 74.
[289] Porter and March, *The Battle*, p. 41.
[290] Ibid, p. 80.
[291] Blakemore and Murphy, *The British*, p. 137; Lea-O'Mahoney, *The Navy*, p.199.
[292] Underdown, *Revel*, pp. viii, 183-184; C. Holmes, *The Eastern Association in the English Civil War*, 1974, p. 172.
[293] R Richardson, *The Debate on the English Revolution*, 1998, p. 45.

sixteenth and seventeenth centuries which affected the social composition of supporters of the crown and parliament:

> ... between 1540 and 1640 ... The number of peers rose from 60 to 160; baronets and knights from 500 to 1400; esquires from perhaps 800 to 3,000; and armigerous gentry from perhaps 5,000 to 15,000 ... This numerical expansion was made possible mainly by the transfer of huge quantities of landed property first from the church to the crown and then from the crown to the laity, mostly gentry, in a series of massive sales to pay for foreign wars.[294]

The House of Commons itself changed during this period, 'so that it grew from about 300 to approximately 500, and the gentry component in it rose from about 50 per cent to approximately 75 per cent.'[295] Throughout the civil war there were major changes in the numbers of adherents to the parliamentarian and royalist armies, making it difficult to carry out statistical analysis of membership numbers. The alignment of forces of 1640 was quite different from that of 1642, by which time a large block of former Parliamentarians had moved over to reluctant Royalism.

There were changes again in 1648, when 'conservative elements among the Parliamentarians, misleadingly known as Presbyterians, swung back to the side of the king.'[296] Many of those who had supported parliament on constitutional grounds in 1640, like Sir Edward Hyde, transferred their allegiance in 1642, whereas those who supported parliament on religious grounds tended to continue to support the parliamentary cause.[297]

The most significant change in parliament occurred in December 1648 when 'under the command of Colonel Thomas Pride, the army purged the House of Commons of any opposition (some 100 MPs were excluded 45 who were actually arrested – others prudently removed themselves). It was the remaining

---

[294] Stone, *Causes*, pp. 72, 73.
[295] Ibid, p. 92.
[296] Ibid, p. 34.
[297] Ibid, p., 143.

"Rump" of around 70 MPs who would address the matter of bringing the King to trial.'[298]

There were also major changes in demographic and economic conditions during the second half of the sixteenth and first half of the seventeenth centuries. Population grew by over 30 per cent in the period 1570-1609 and prices more than doubled between 1550 and 1600.[299] Lawrence Stone noted the changes that had taken place in English society during the sixteenth century as a result of population growth: 'the excess supply of labour relative to demand not only increased unemployment, but forced down real wages to an alarming degree ... [there was] a polarisation of society into rich and poor: the upper classes became relatively more numerous and their real incomes rose; the poor also became more numerous and their real incomes fell.'[300]

Recent research by Alexandra Shepard using church court depositions indicates that wealth inequality increased markedly during the first half of the seventeenth century.

---

[298] D. Flintham, *Civil War London*, 2017, p. 41.

[299] E.A. Wrigley, R.S. Schofield, *The Population History of England & Wales*, 1981; B.R. Mitchell, P. Deane, *Abstract of British Historical Statistics*, 1971, pp. 484-486; J. Thirsk, 'The farming regions', pp. 857, 858, 1861; E.H. Phelps-Brown, S.V. Hopkins**,** 'Seven centuries of the prices of consumables compared with builders' wage rates' in E.M. Carus-Wilson (ed.), *Essays in Economic History,* Volume 2, 1962, pp. 193-195.

[300] L. Stone, 'Social mobility in England, 1500-1700', *Past and Present*, Volume 33, 1966, pp. 26-29, 49.

Table 4: Median Wealth in England, Deflated to 1550-1559 Values, by Social Group Over Time.[301]

	1550-74	1575-99	1600-24	1625-49
Gentry (N = 367)	£16.00	£8.00	£59.30	£50.00
Yeomen (N = 1104)	£5.34	£7.27	£23.92	£50.00
Craft/Trade (N = 2185)	£2.40	£1.40	£2.99	£5.00
Husbandmen (N = 2127)	£4.00	£3.37	£5.93	£5.00
Labourers (N = 273)	£1.58	£1.35	£1.36	£1.03

Although the gentry increased their wealth – increasing by about three times – the yeomen's wealth had grown nearly ten times, while labourers' worth decreased slightly. There was little change among husbandmen and a doubling of wealth among craft/tradesmen. This data suggests that this was a period of 'the rise of the yeomanry' during the first half of the seventeenth century. Wrightson has summarized the situation of yeomen:

> Like the gentry, they benefited from low labour costs as employers, while as large-scale producers they stood to gain from rising prices ... Again like the gentry, they took a thoroughly rational and calculating attitude towards profit ... often ambitious, aggressive, [and] small capitalists ... [they experienced] gradually rising living standards, the rebuilding of farmhouses and their stocking with goods of increasing sophistication and comfort.[302]

These changes had a significant effect on the relationships between different social classes. Village elites composed of local gentry and prosperous yeomen farmers and tradesmen began to attempt to control the impoverished and unruly elements of the poor.[303]

---

[301] Data from *Perceptions of Worth and Social Status in Early Modern England* , ESRC Reference Number RES-000-23-1111.
[302] Wrightson, *English Society*, pp. 134, 135.
[303] Manning, *The English People*, p. 46; Wrightson, *English Society*, pp. 168-73, 181.

> Long before the civil war, especially in towns and pasture regions where cloth-working or other industrial pursuits were available, the growing gulf between the people 'of credit and reputation' and their less prosperous neighbours was reflected in the emergence of parish elites who saw it as their duty to discipline the poor into godliness and industriousness, and who found in puritan teaching (broadly defined) their guide and inspiration. Along with reformist elements of the gentry and clergy, they mounted a campaign against the traditional culture of the lower orders.[304]

The merging of interests between the gentry and prosperous yeomen and tradesmen makes it difficult to distinguish social statuses in this period.[305] One-hundred-and-two Yorkshiremen obtained coats of arms as gentlemen between 1558 and 1642 and roughly half of them were yeomen farmers. In Lancashire two-hundred-and-two families entered the gentry: ...'the majority were prosperous yeomen.'[306] Gordon Batho has concluded that 'there was no sharp distinction between lesser gentry and the richer yeomen ... In innumerable wills and legal documents of the age a man is described in one place as a yeoman and in another as a gentleman ... '[307]

Oliver Cromwell himself illustrates the ambiguity of status in this period. John Morrill has summarised the evidence as follows:

> ... his standing in St Ives was essentially that of a yeoman, a working farmer. He had moved down from the gentry to the 'middling sort' ... Despite his connections with ancient riches, Cromwell's economic status was much closer to that of the 'middling sort' than that to the country gentry and governors. He always lived in towns, not in a country manor house; and he worked for his living. He held no important local offices and had no tenants or others dependent upon

---

[304] Underdown, *Revel*, pp. 275, 276.
[305] Hirst, *The Representative,* p. 4; see also O'Day, 'Universities', p. fn 19, p. 100; Wedgwood, *The King's War*, p. 205.
[306] Manning, *1649: The Crisis*, p. 58.
[307] Ibid.

> him beyond a few household servants. When he pleaded for the selection of 'russet-coated captains who know what they are fighting for', and when he described his troopers as 'honest men, such as feared God', this was not the condescension of a radical member of the elite, but the pleas of a man on the margins of the gentry on behalf of those with whom he had had social discourse and daily communion for twenty years.

A further example of the blurring of statuses is to be found in Shakespeare's social circle in Stratford:

> The Quiney family was one of the most respectable in the town; they bore arms, had been long settled in the community, and were influential members of the corporation. They were well-educated – Richard conducted much of his correspondence with Abraham Sturley, who had been educated at Queen's College, Cambridge, in Latin – and appears from the language of this correspondence, to have been strongly puritan. Nevertheless, along with all other leading townsmen, they frequently engaged in illegal speculative activity, particularly in corn and malt.[308]

Shakespeare's own family illustrates the ambiguities in status at the end of the sixteenth century. His father John, officially a glover, had illegally traded in wool, corn and money-lending, and had yet been granted a coat of arms in 1596, warranting the title and status of 'gentleman', in spite of an earlier bankruptcy.[309] Shakespeare himself also engaged in these illegal activities. Not only did local tradesmen engage in the hoarding of grain during a period of scarcity, but all four local landed magistrates had arrangements with the townsmen to illegally store large stocks of grain on their behalf.[310] In 1601 the poor of Stratford were 'in number seven hundred and odd, young and old – something like forty per cent of the total population.'[311] As a result, the hoarding

---

[308] P. Razzell, *William Shakespeare: The Anatomy of an Enigma*, 1990, p. 26.
[309] Ibid, p. 28.
[310] Ibid, p. 142.
.[311] Ibid, p. 140

of grain resulted in threatened violence and riot by the poor, but they unwittingly appealed to the magistrates without realising that they were some of the leading forestallers of grain.[312]

The conflicting and contradictory position of the townsmen and local gentry, many of whom were of the Puritan persuasion, left them exposed to the charge of hypocrisy. When a dispute over the appointment of the Puritan minister, Thomas Wilson, broke out in 1621, his supporters were satirized in the following verse: 'Stratford is a Town that doth make a great show. But yet is governed but by a few. O Jesus Christ of heaven I think that they are but seven Puritans without doubt? For you may know them. They are so stout. They say 'tis no sin, their neighbour's house to take. But such laws their father the devil did make ... One of the Chiefest hath read far in Perkin's works. The rest are deep dissembling hypocrites.'[313]

There was a great deal of social mobility at this time, with many wealthy yeomen and tradesmen achieving gentry status during the first half of the seventeenth century.[314] Gentlemen and yeomen/tradesmen were educated together in local grammar schools and universities, and so shared similar cultural backgrounds.[315] There was also an increase in the literacy of both the gentry and the middle classes, whereas most husbandmen and labourers remained illiterate during this period.[316] Because of the fear of literacy amongst the 'lower sort', as early as 1543 parliament had stipulated that 'no women, nor artificers, prentices, journeymen, servingmen of the degrees of yeomen or under, husbandmen nor labourers shall read the Bible or New Testament in English to himself or any other, privately or

---

[312] Ibid, pp. 141, 142.
[313] Ibid.
[314] Wrightson, *English Society*, p.27; see also Manning, *1649 The Crisis*, p. 51.
[315] R. O'Day, 'Universities and professions in the early modern period', *oro.open.ac.uk*, pp. 83, 87, 101; Wrightson, *English Society,* pp. 89; 186, 191-193; Stone, *Causes*, pp. 74.
[316] Wrightson, *English Society,* p. 191.

openly.'[317] Hobbes had complained that 'after the Bible was translated into English, every man, nay every boy and wench, that could read English thought they spoke with God Almighty and understood what He said.'[318]

The fear that established authority had of the 'lower sort' obtaining literacy was probably well-founded. As early as the fourteenth and fifteenth centuries 'throughout southern and central England groups of Lollards met secretly in towns and villages to read or listen to readings of Scripture and to consider their contemporary application. Most of them came from the class of skilled, literate traders and craftsmen. They were masons, carpenters, wool-merchants and leatherworkers – men and women whose work took them long distances in search of employment and markets.'[319]

This was as we have seen the classic socio-economic group associated with puritanism, but nevertheless there were many adherents of a higher status. When Prynne, Burton and Bastwick, martyrs to the protestant cause who had been punished and exiled by the king, returned to London on the 28th November 1640, 'some three thousand coaches, and four thousand horsemen' were included in the crowd that welcomed them back to London.[320] During the building of the defensive wall around London, the people helping to build the wall included 'a great company of the common council and diverse other chief men of the city'.[321]

Nevertheless the evidence suggests that wealthy aldermen largely supported the crown: 'strong financial ties bound the wealthy citizens to the crown ... the court contented itself with the belief that the disturbances involved the meaner sort of people and that the affections of the better and main part of the

---

[317] D. Wilson, *The People and the Book: The Revolutionary Impact of the English Bible 1380-1611*, 1976, p. 87.
[318] Stone, *Causes*, p.101.
[319] Wilson, *The People*, p. 26.
[320] Purkiss, *The English*, p. 99.
[321] Ibid, p. 286.

city favoured the king.' [322] As a result of this belief, the king placed a guard to the approaches of the Commons with soldiers 'who disliked or despised the Londoners and officers who, being Westminster men, were friends and dependents of the Court.'[323] Clarendon summarized his conclusions about the link between status and affiliation to crown or parliament:

> ... though the people in general [favoured the king], (except in great towns and corporations, where, besides the natural malignity, the factious lecturers, and emissaries from the parliament, had poisoned the affections,) and especially those of quality, were loyally inclined ...[324]

Most contemporaries believed that the main support for parliament came from London and other corporate towns, with a strong support from the middle sort.[325]

Lilly writing in 1651 described how the terms Cavalier and Roundhead originated:

> They [the Puritans] had their hair of their heads very few of them longer than their ears, whereupon it came to pass that those who usually with their cries attended at Westminster were by a nickname called *Roundheads*, and all that took part or appeared for his Majesty, *Cavaliers* ... However the present hatred of the citizens was such unto gentlemen, especially courtiers, that few durst come into the city; or if they did they were sure to receive affronts and be abused.[326]

---

[322] S. Porter, S. Marsh, *The Battle for London*, 2010, p. 9; see also D. Hirst, *The Representative of the People? Voting in England under the Early Stuarts*, 1975, p. 138; R. Ashton, *The City and the Court, 1603-1643*, 1979, p. 206; Pearl, *London*, p. xi.

[323] Wedgwood, *The King's War*, p. 32.

[324] Hyde, *The History*, Volume 2, p. 226.

[325] An indication of where the city's sympathies lay was the return of four members opposed to the court in the election to the Long Parliament in October 1640.

[326] W. Lilly *The True History of King James I and Charles* I, 1715, pp. 55-56 – first published in 1651, p. 246. The association between puritanism and

Pepys in his diary frequently distinguished between citizens and gentlemen living in London; for example at the end of December 1662 he wrote 'only not so well pleased with the company at the house today, which was full of Citizens, there hardly being a gentleman or woman in the house ...'[327]

There is evidence however of tensions between the aristocracy and gentry on the one hand and the middle classes during the outbreak of the civil war. The burden of ship money fell disproportionately on yeomanry and tradesmen, something which was highlighted by William Prynne in his attacks on the crown.[328] These tensions were exacerbated by the attitudes of the aristocracy and gentry towards the new middle classes.

> The pretensions of yeomen to quality with gentry caused resentment amongst some gentlemen. 'The yeomanry' wrote Edward Chamberlayne ...'grow rich, and thereby so proud, insolent, and careless, that they neither give that humble respect and awful reverence which in other Kingdoms is usually given to nobility, gentry, and clergy' ... which has 'rendered them so distasteful ... even to their own gentry' that the latter sometimes wished that the yeomen's activities were less profitable or they were taxed more heavily.[329]

This is consistent with the patterns of wealth depicted in Shepard's analysis of church court depositions, whereby the yeomanry achieved parity with the gentry by the middle of the seventeenth century.

---

short hair was also found in New England where the rule was 'that none should wear their hair below their ears'. T. Hutchinson, *The History of the Colony and Province of Massachusetts*, Vol.1, 1936, pp. 130, 131. Some Baptists continued to prohibit long hair as late as 1689. See A.C. Underwood, *A History of the English Baptists,* 1947, p.130.

[327] R. Latham, W. Matthews (eds.), *The Diary of Samuel Pepys*, Volume 3, 1995, p. 295.

[328] See Manning, *The English People*, pp. 10, 231.

[329] E. Chamberlayne, *Anglia Notitia*, 1672, pp. 61-63.

A number of scholars have noted the breaking of the alliance between the gentry and the middle classes, as the demands for political and religious reforms began to emerge.[330] However, this reflected some long-term tensions between these socio-economic groups. For example, as early as 1576, a clause was inserted in an Act of Parliament prohibiting West Country clothiers from buying more than 20 acres of land.[331]

In Somerset it was alleged that

> ... a great part of the estate of every farmer or substantial yeoman should be taken from them; alleging that some lords had said that £20 by the year was enough for any peasant to live by ... persuading the substantial yeomen and freeholders that at least two parts of their states would by that commission taken from them ... For though the gentlemen of ancient families estates in that county were for the most part well affected to the King ... yet there were people of inferior degree, who, by good husbandry, clothing, and other thriving arts, had gotten very great fortunes, and, by degrees getting themselves into the gentlemen's estates, were angry that they found not themselves in the same esteem and reputation with those whose estates they had ... These from the beginning were fast friends to the Parliament, and many of them were now entrusted by them as deputy-lieutenants in their new ordinance of the militia ... [332]

Likewise in Yorkshire when the king summoned the gentry of the county to York in May 1642, he omitted to summon the freeholders, who responded by claiming 'ourselves equally interested in the common good of the county', and as a result 'did take boldness to come in person to York ... thereupon the doors of the meeting house were shut, we utterly excluded ...'[333] Elsewhere 'Lord Paulet in opposition to the Militia at a combustion in *Wells* ... declared that it was not fit for any Yeomen to have allowed more than the poor Moitie of ten

---

[330] Manning, *The English People*, p. 46
[331] L. Stone, *The Crisis of the Aristocracy*, 1965, p. 28.
[332] Hyde, *History,* Volume 2, p, 296.
[333] Hill and Dell, *The Good Old*, pp. 244, 245.

pounds a year ... when the power should be totally on their [the royalists'] side, they shall be compelled to live at that low allowance ... the people did not take the speech as only directed to the Yeomen, but to all men under the degree of a Gentleman ... the Tradesmen and Merchants ....[334]

One Parliamentarian tract published in 1643 claimed

> that this was proof that the royalists intended 'a government at discretion' after the French fashion, because 'the middle sort of people of England, and yeomanry' were the chief obstacles to such a change, and as they composed the main part of the militia, 'then by policy, or even plain force' they must be disarmed ...[335]

This can be seen indirectly as a consequence of 'the rise of the yeomanry', creating increasing demands by yeomen for equal status with their aristocratic and gentry neighbours. This resulted in tension between these groups, leading on occasions to violence. For example, 'the cavaliers in Somersetshire have used violence on the yeomanry, and have turned them out of doors, and take their arms from them, the people seeing it could not suffer it, for if they prevail now they think they shall be slaves forever.'[336]

Fear was a leading component of the civil war. As we have seen, in London the king and many Members of Parliament and the House of Lords had left London in early 1642 as a result of the fear of the population threatening them with violence and intimidation. Many of these members had originally supported parliament on constitutional grounds, but fear had driven them into the support of the king. Many Protestants feared Catholics, particularly after Spain's attempt to invade England during the late sixteenth century. In the provinces many of the aristocracy and gentry feared the threats from the poor and the increasing

---

[334] *A Memento for Yeomen, Merchants, Citizens and All the Commons in England,* August 23, 1642, B.M. E 113 (13), pp. 4, 5.
[335] Manning, *Aristocrats,* p. 69.
[336] Manning, *The English People*, p. 328.

radicalism of the middle classes. And at a later stage of the war, the Presbyterians feared the increasing power of the radicals in the New Model Army.

A similar process occurred in France in the eighteenth century when the middle classes were not allowed to access higher social statuses, which according to Eleanor Barber was one of the factors behind the French Revolution.[337] There is ample evidence that the middle classes played a significant role in political developments in the English civil war, although the claim that the middle sort were the main supporters of parliament has been contested by a number of historians.[338] There is however plenty of contemporary literary evidence to indicate that the middle classes played an important role in the support of parliament. Keith Wrightson has summarised this evidence**:**

> London demonstrators against episcopacy in 1641 were characterized as being 'men of mean or a middle quality', as distinct from both 'aldermen, merchants or common councilmen' on the one hand, and the 'vulgar' on the other. In Worcester 'the middle sort of people' supported the parliamentarian cause. 'The middle and inferior sort of people' of Birmingham resisted Prince Rupert's advance in 1643 despite the defeatist fears of the 'better sort'. At Bristol 'the King's cause and party were favoured by two extremes in that city; the one the wealthy and powerful men, the other of the basest and lowest sort, but disgusted by the middle rank, the true and best citizens'. Such activism and the terms in which it was described were not confined to urban centres. In Somerset the royalists were said to consist of most of the gentry and their tenants, while parliament had the support of 'yeomen, farmers, petty freeholders, and such as use manufacturers that enrich the country', under the leadership of some gentlemen and others of lesser degree, who 'by good husbandry, clothing and other thriving arts, had gotten very

[337] E. Barber, *The Bourgeoisie in 18th Century France*, 1957, p. 142.

[338] The main proponent of the middle sort hypothesis is Manning in his *The English People*. The critics of this thesis have pointed out that many of the middle classes supported royalism or remained neutral. See J. Barry and C, Brooks (eds.), *The Middling Sort of People: Culture, Society and Politics in England, 1550-1800*, 1994, p. 22; Morrill (ed.), *Reactions*, p. 71.

> great fortunes' In Gloucestershire the king was supported by both the rich and 'the needy multitude' who depended upon them. Parliament allegedly had the hearts of 'the yeomen, farmers, clothiers, and the whole middle rank of the people'. According to Lucy Hutchinson, 'most of the gentry' of Nottinghamshire 'were disaffected to the parliament', but 'most of the middle sort, the able substantial freeholders, and the other commons, who had not their dependence upon the malignant nobility and gentry, adhered to the parliament.' Again, Richard Baxter saw the king as finding support among most lords, knights and gentlemen of England, together with their tenants and 'most of the poorest people', while parliament had a minority of the gentry 'and the greatest part of the tradesmen and freeholders and the middle sort of men, especially in those corporations and countries which depend on clothing and such manufactures'.[339]

The critique of the thesis that the 'middle sort' were the chief supporters of parliament, has not allowed for the major support for parliament of the middle classes in London, who were the prime movers at the beginning of the civil war and were the mainstay of the New Model Army who shaped its outcome.

The turning point in the support of London for parliament occurred in elections held on December 21 1641 to the Common Council brought in men with active parliamentary Puritan sympathies. These elections transformed the politics of London, and Clarendon attributed to them the king's departure from Whitehall early in January 1642.[340]

The take-over by radical elements of the Common Council in December 1641, 'when that body was effectively captured by the radical party ... Now (wrote one later royalist sympathizer) outgoe all the grave, discreet, well-affected Citizens ... and in their Stead are chosen *Fowke* the Traytor, *Ryley* the Squeeking bodyes-maker, *Perkins* the Taylor, *Norminton* the Cutler, young beardless *Coulson* the Dyer, *Gill*

---

[339] K. Wrightson, 'Sorts of people in Tudor and Stuart England' in Barry and Brooks, *The Middling Sort*, p. 46.
[340] Pearl, *London*, p. 132.

the Wine-Cooper, and *Jupe* the Laten-man in *Crooked-Lane, Beadle* of the Ward ...'[341]

This was a time of revolutionary fervour:

> when Alderman *Pennington* and Captain *Venne* brought down their Myrmidons to assault and terrrifie the Members of both Houses, whose faces or opinion they liked not ... when these rude multitudes published the names of Members of both Houses, as enemies of the Commonwealth, who would not agree to their frantic propositions; when the names of those were given by Members of the House, that they might be proscribed, and torn in pieces by those Multitudes, when many were driven away for fear of their lives from being present at those consultations?[342]

This resulted in 236 MPs leaving parliament in June 1642, mostly to join the King at York.[343] Class hostility grew during the civil war, often associated with religious radicalism. Positions in local and other authorities were increasingly held by wealthy members of the middle classes. The nobility and gentry who had supported parliament against the king found that they were neglected, and people of lower status were preferred for places of authority. Clarendon noted that

> The nobility and gentry who had advance the credit and reputation of the Parliament by concurring with it against the King found themselves totally neglected, and the most inferior people preferred at all places of trust and profit ... most of those persons of condition, who ... had been seduced to do them [parliament] service throughout the kingdom, decline to appear longer in so detestable employment; and now a more inferior sort of the common people succeeded in those employments, who thereby exercised so great an insolence over those were in quality above them, and who always had a power over them, that was very grievous ... all distinction of quality being renounced. And they who were not above the condition of ordinary inferior constables six or seven years before, were now the justices of

[341] Ashton, *The City*, pp. 205, 206.
[342] Ibid, p. 215. See also Stone, *Causes*, p.145.
[343] Stone, *Causes*, p.141.

> peace, sequestrators, and commissioners; who executed the commands of Parliament in all the counties of the kingdom with such rigour and tyranny as was natural for such persons to use over and towards those upon whom they had formerly looked at such a distance.[344]

Lucy the wife of Thomas Hutchinson tells 'how her husband, the parliamentary officer, found that his allies in Nottinghamshire distrusted civility, thinking it scarce possible for anyone to continue to be both a gentleman and a supporter of the godly interest.'[345]

In 1646 the Presbyterian Thomas Edwards declared that in the previous two years, and especially since parliament's victory at Naseby, the sectaries had in the most insolent and unheard-of manner abused 'all sorts and ranks of men even to the highest.'[346] Clarenden complained that the sects had 'discountenanced all forms of reverence and respect, as relics and marks of superstition.' In 1663 the Lord Mayor of London issued an order forbidding and repetition of the 'rudeness, affronts, and insolent behaviour' displayed by 'the unruly and meaner sort of people' during the Interregnum towards noblemen, gentlemen and persons of quality passing in their coaches or walking through the streets of the City. This 'undutifulness and contempt of their superiors', he claimed, had been encouraged by the 'late usurped powers.' In fact, similar orders had been issued in 1621, for hostility to strangers and jeering at the coaches of the aristocracy, and were endemic in pre-civil war London.[347]

However, the civil war increased this hostility:

> ... the fury and license of the common people, who were in all places grown to that barbarity and rage against the nobility and gentry, (under the style of *cavaliers*,) that it was not safe for any to live at

---

[344] Hyde, *The History*, Volume 4, pp. 287, 315.
[345] L. Hutchinson, *Memoirs of the Life of Colonel* Hutchinson, 1972, p.132.
[346] Manning, *1649: The Crisis*, p. 321.
[347] K. Thomas, *In Pursuit of Civility: Manners and Civilization in Early Modern England*, 2018, p. 322.

their houses who were taken notice of as no votaries to the Parliament.[348]

The City authorities complained to the king that most of the disorders came not from them but 'from the unregulated and disorderly suburbs', located in 'the skirts of the city where the Lord Mayor and magistrates of London have neither power ... [and which were] fuller of the meaner sort of people.'[349] The reaction by wealthy merchants in London after 1643 accounted for the development of political presbyterianism in the City.[350] Presbyterianism attracted both aristocrats and the gentry not only in London but elsewhere in the country, and contemporaries saw the Independents, Baptists and Quakers as the main source of the extreme and radical opposition to the crown.[351] The Quakers turned out to be the most radical of the sects, including a refusal to pay tithes or to doth hats to superiors and recognize titles, which appeared extremely threatening to established authority.[352] They also criticised the aristocracy and gentry, claiming that the latter owed their position to the 'Norman Yoke', seizing land and property by forceful dispossession.[353]

Although the Quakers had relatively humble origins – many of them had come from a Baptist background[354] – they were very literate and established their own libraries with printed books and tracts.[355] Although they eventually espoused pacifism, during the civil war period they were active in the parliamentary army.[356] All Puritan denominations appear to have had high

[348] Ibid, p. 318. See also Hill and Dell, *The Good Old*, p. 246.
[349] Pearl, *London*, p. 129.
[350] Ibid, p.284.
[351] Jennings, *The Gathering*, pp. 174, 175, 187; G. Yule, *The Independents in the English Civil War*, 1958, p. 57.
[352] Jennings, *The Gathering*, p, 187.
[353] B. Reay, *The Quakers and the English Revolution*, 1985, p. 39.
[354] Jennings, *The Gathering*, p.269; Reay, *The Quakers*, p. 20.
[355] Jennings, *The Gathering*, pp. 260, 261.
[356] Reay, *The Quakers*, pp. 41, 42, 50.

levels of literacy, particularly the Presbyterians, many of whose ministers had university degrees.[357]

Socio-Economic Status and the Royalist and New Model Armies.

There is a difficulty in analyzing the social status of the parliamentary army during the civil war because of its changing composition and numbers. 'In March 1649, the Commonwealth had in England 44,373 soldiers ... in July 1652 had nearly 70,000, whereas in February 1660, its numbers were fixed at 28,342.'[358] This is less of a difficulty with the royalist army as it was in existence for only a relatively short period.

This essay will focus on the New Model Army, for which there is relatively full information. It was also the most radical of all of parliament's armies, playing the major role in the outcome of the war. According to Ian Gentiles, 'while the number of horse [in the New Model] remained fairly stable between roughly 5,000 and 6,500, the foot and the dragoons underwent violent fluctuations in numbers, from 18,000 to 7,000, owing to massive desertions. The men who stamped the New Model with a distinctive character were therefore a tight group numbering about 5,000 horse and 7,000 foot.'[359] It is these fluctuations which make statistical analysis so difficult, and it is therefore necessary to rely mainly on literary evidence.

The origin of the social status of the New Model Army lies in the recruitment of officers to the Eastern Association. One of the officers of the army, Dodson a native of the Isle of Ely, had served with Cromwell from the outbreak of the war, and described how Cromwell had packed the army with officers

---

[357] Jennings, *The Gathering,* p. 244.
[358] C.H. Firth, *Cromwell's Army,* 1902, pp. 34, 35.
[359] I. Gentiles, *The New Model Army in England, Ireland and Scotland, 1645-1653,* 1992, p. 40.

sympathetic to the sectaries – that in choosing officers for his own regiment, he had dismissed 'honest gentlemen and souldiers that ware stout in the cause', and replaced them 'with common men, pore and of meane parentage, onely – he would give them the title of godly pretious men'.[360] Whitelocke, another contemporary, described Cromwell's men 'as being mostly freeholders and freeholders' sons, who had engaged in this quarrel upon a matter of conscience.'[361]

However there is some evidence that in the early years the aristocracy and gentry played a significant role in the parliamentary army. Baxter claimed that when 'the *Earl of Essex* came to *Worcester*, with many Lords and Knights, and in a flourishing [parliamentary] army, [they were] gallantly cloathed ...'[362] This was confirmed by another source which claimed that in the parliamentary army 'only seven of the new colonels were not gentlemen, and of nine of them were from noble families.'[363] This was in the early stages of the civil war when constitutional concerns were the dominant issue. In June 1647 there was a purge of conservative presbyterian officers from the army, including 'some of the most socially distinguished of the army's founders.'[364]

The discipline for which the New Model was famous for originated in the way Cromwell treated his troops. 'At Huntingdon, two troopers who tried to desert were whipped in the market place ... Colonel Cromwell had 2,000 brave men, well disciplined; no man swears but he pays his twelve pence; if he be drunk he is set in the stocks, or worse, if one call the other "Roundhead" he is cashiered ...'[365] This religious zeal was partly responsible for the discipline that the New Model Army showed

---

[360] Holmes, *The Eastern*, p. 199.
[361] A. Fraser, *Cromwell Our Chief of Men,* 1974, p. 100.
[362] Baxter, *Reliquiare Baxterianae*, Part 1, p. 42.
[363] Purkiss, *The English,* p. 421.
[364] I. Gentiles, 'The New Model Officer Corps in 1647: a collective portrait', *Social History,* 22:2 (1997), p. 130.
[365] Ibid, p. 101.

in battle, allowing them to defeat royalist armies. However, this was also the result of harsh discipline 'including penalties for drunkenness and fornication; blasphemers [who] had their tongues pierced with a hot iron.'[366] In 1654, two soldiers 'were nailed by their ears to the whipping post at Charing Cross for taking bribes.'[367]

The army also had a reputation for being 'the praying army'[368], and their religious faith along with their discipline 'explained why small handfuls of New Model soldiers were able to put much larger numbers of royalists to flight.'[369] As the Venetian ambassador observed of the New Model, 'This much is certain that the troops live as precisely as if they were a brotherhood of monks ... It was observed in the late wars that when the royal forces gained a victory they abandoned themselves to wine and debauchery, while those commanded by Cromwell, after their greatest successes were obliged to pray and fast.'[370]

According to Anthony Fletcher, 'the instructions sent to [royalist] commissioners of array made it quite clear ... that the officers were all 'persons of quality' with considerable local estates.'[371] Cromwell largely concurred with this analysis, claiming that he had confronted Hampden about parliamentary soldiers in the early period of the civil war, stating that 'your troopers ... are most of them old decayed serving men and tapsters, and such kind of fellows, and, said I, their troopers are gentlemen's sons, younger sons, persons of quality: do you think that the spirits of such base and mean fellows will ever be able to

---

[366] R. Tombs, *The English and their History,* 2015, p. 230.
[367] Lincoln, *London*, p. 137.
[368] Gentles, *The New Model Army, 1645-53*, p. 94.
[369] Ibid, p. 95.
[370] Relatzione of England by Giovanni Sagredo, 1656, Razzell, *The English Revolution*, p. 19.
[371] Fletcher, *The Outbreak,* p. 356.

encounter gentlemen that have honour, courage and resolution in them?'[372]

There is other evidence to confirm this statement. According to one source 'the King's forces in the windy summer morning looked magnificent, with bright fluttering banners of every colour and fantasy, as the light flashed from polished breastplates, glowed on damask banners, taffeta scarves and velvet cloaks.'[373] Cromwell was moved to prayer: 'When I saw the enemy draw up and march in gallant order towards us, and we a company of poor ignorant men ...'[374] According to Gentiles

> All Charles's officers at Oxford from the rank of captain upwards, were of gentry or more exalted status. His regimental commanders early in the war were all noblemen or higher gentry. Throughout the whole royalist army fully 90 per cent of the regimental commanders were gentlemen or peers ... the practice of promoting men from the ranks, which was so common in the New Model, was wholly absent in the Oxford army.[375]

The difficulty in analysing the New Model's composition is that 'of the total officer corps in 1648, half came from backgrounds so obscure that no information can be recovered about them.'[376] However, Gentles who has made the most detailed study of them concluded that of the officers in 1647 'twenty-two – about 9 per cent of the total – are known to have had some form of higher education ... Thirty-seven men or about one-sixth ... are known to have risen from non-commissioned rank ... [and] a high proportion ... even at the rank of colonel, were men of relatively low social status ... it is the strongly urban character of the officer corps that is most striking.' [377]

---

[372] I. Roots (ed.), *Speeches of Oliver Cromwell*, 1989, p 134. See also Ibid, p. 10; Yule, *The Independents*, p. 60.
[373] Wedgwood, *The King's War*, p. 452.
[374] Ibid, p.452.
[375] Gentiles, 'The New Model Officer Corps in 1647', p. 143.
[376] Hutton, *The British Republic*, p. 6.
[377] Gentiles, 'The New Model Officer Corps in 1647', pp. 135, 137, 140, 143.

These conclusions are confirmed by literary accounts by both royalists and parliamentarians. The royalist Denzil Holles, believed that the officers 'from the general ... to the meanest sentinel, are not able to make a thousand a year lands; most of the colonels are tradesmen, brewers, tailors, goldsmiths, shoemakers and the like.'[378] According to another hostile contemporary account it claimed that if you 'Deduct the weavers, tailors, brewers, cobblers, tinkers, carmen, draymen, broom-men, and then give me a list of the gentlemen. Their names may be writ in text, within the compass of a single halfpenny.'[379] The Earl of Manchester wrote in 1645, that Cromwell had chosen for his army 'not such as were soldiers or men of estates, but such as were common men, poor and of mean parentage, only he would give them the title of godly, precious men.'[380]' In August 1643 Cromwell justified his mode of selection in a famous speech.

> It may be it provoked some spirits to see such plain men made captains of horse. It had been well that men of honour and birth had entered into these employments, but why do they not appear? Who would have hindered them? But since it was necessary the work must go on, better plain men than none. ... I had rather have a plain russet-coated captain that knows what he fights for and loves what he knows than what you call a gentleman and is nothing else.[381]

In a vindication of the New Model from the charge of intending to sack London, published in the summer of 1647, it is asserted: 'There are verie few of us, but have most of this world's interest in the Citie of London, being chiefly and principally raised

---

[378] F. Maseres, 'Memoirs of Denzil Lord Holles', *Select Tract Relating to the Civil Wars in England in the Reign of Charles the First*, 1815, p. 277.
[379] *Mercurius Elencticus*, 7-14 June 1648.
[380] C. Hill, *God's Englishman: Oliver Cromwell and the English Revolution*, 1970, pp. 65, 66.
[381] Ibid, pp. 66, 67.

thence, and verie many, especially of our officers, being citizens themselves having their wives and children therein.'[382]

Samuel Pepys in his diary for the ninth December 1663 confirmed the role of London artisans and tradesmen in the New Model Army:

> of all the old army now, you cannot see a man begging about the street. But what? You shall have this Captain turned a shoemaker, the lieutenant, a Baker; this, a brewer; that, a haberdasher; this common soldier, a porter; and every man in his apron and frock, etc, as if they had never done anything else – whereas the other [cavaliers] go with their belts and swords, swearing and cursing and stealing – running into people's houses, by force oftentimes, to carry away something. And this is the difference between the temper of one and the other ... [383]

Previously on the 4th July 1663 while watching the royal army parade through London, he had observed that 'all these gay men [royalist horse and foot] are not the soldiers that must do the King's business, it being such as these that lost the old King all he had and were beat by the most ordinary fellows that could be.'[384]

It was the junior officers of the New Model who frequently undertook independent political action, such as Cornet Joyce's seizing of the king at Holdenbury and placing pressure on Cromwell and the senior officers to bring the king to trial and eventual execution.[385] The wealthy Presbyterians who dominated London's government at this time, attempted to block the New Model's access to parliament in 1647, but this was thwarted by the army sweeping away the resistance of the trained bands.[386]

---

[382] C.H. Firth, *Cromwell's Army: a History of the English Soldier during the Civil War*, 1912, p. 47.
[383] Latham and Matthews, *The Diary*, Volume 4, 1995, pp. 373, 374.
[384] Ibid, p. 217.
[385] B. Coward, *Cromwell: Profiles in Power,* 1991, p. 50.
[386] J.T. Schroeder, 'London and the New Model Army, 1647', *The Historian*, Volume 19, No. 3, May 1957, p. 249.

The New Model was reinforced by volunteers raised by Skippon in the suburbs, who were 'predominantly servants and apprentices'.[387] It is no accident that the New Model had been able to gain access to London Bridge through Southwark, which had long been a support of the radicals both in parliament and the army. This culminated in the purging of parliament led by Colonel Pride, leaving a rump of about 70 Independent MPs.[388]

In order to confirm the low social status of the New Model, an analysis has been carried out to compare the socio-economic status through university attendance of Royalist and New Model officers during the civil war period. The essence of the analysis is to make a comparison using an identical methodology for both armies. It indicates that the Royalist officers were of significantly higher social status than those of the New Model, confirming the literary evidence reviewed above.

[387] L.C. Nagel, *The Militia of London, 1641-1642,* D.Phil. Thesis, Kings College, University of London, p. 303.
[388] Flintham, *Civil War*, p. 41.

Table 5: Proportions of Royalist and New Model Army Officers Graduating from Oxford and Cambridge Universities.[389]

	Total In Sample	Number Graduating from Oxford	Number Graduating from Cambridge	Total Proportion Graduating
Royalist Officers, 1642-60	100	27	25	52%
New Model Officers, 1645-49	100	9	6	15%
New Model Officers, 1649-63	100	7	10	17%

There are probably too many false positives in all samples, as suggested by Gentles' finding that only nine per cent of New Model Army officers had received a higher education in 1648, including at the Inns of Court. This suggests that most of these officers were from non-gentry backgrounds.

Conclusion

[389] The above figures are based on a hundred cases selecting the first five names in each alphabetical letter in the relevant biographical dictionaries, covering most alphabetical letters. Only names not appearing in C. Webb's *London Bawdy Court, Consistory Court of London,* Volume 1, 1703-13, 1999 were selected for analysis, in order to avoid common names. The royalist figures are taken from P.R. Newman, *Royalist Officers in England and Wales, 1642-1660: A Biographical Dictionary,* 1981; the New Model Army ones are derived from M. Waklyn, *The New Model Army, Volume 1, 1645-49*, 2015 and M. Waklyn, *The New Model Army, Volume 2, 1649-1663,* 2016. The search for university membership was made through the online alumni listings for both universities.

The revolutionary nature of Cromwell's regime is indicated by a speech he made to the army in 1651 when Charles II threatened to invade England with a Scottish army:

> Cromwell announced to the Army that, if he should fall, England would witness a universal crisis and change the numerous colonels, in all their splendour, who were once tailors, goldsmiths and carpenters [and] would have to make way for the nobility and courtiers.[390]

Aristocrats replaced by tradesmen and artisans in the army – indicating the only social revolution ever to occur in England. The New Model Army was a reflection of a social class which had been influenced by the Leveller movement, holding radical ideas about 'the fundamental rights and liberties ... against all arbitrary power, violence and oppression.'[391] This was an extension of the principles that had led parliament originally to object to Charles I's attempt to impose arbitrary government, a reflection of a culture of individualism. This was a culture particularly associated with literate socio-economic groups, a rebellious culture which could not be suppressed because of the absence of a national army in England.

It was a culture originating in London and other trading towns of England, as well as the pastoral and woodland areas free of manorial control, which in the sixteenth and seventeenth centuries was often associated with puritanism. London's role was expressed most eloquently by the poet John Milton, who described in 1644 his fellow Londoners 'sitting by their studious lamps, musing, searching, revolving new notions and ideas ... reading trying all things, assenting to the force of reason ...'[392] This quote indicates not only the basis of puritanism – the

---

[390] Relatzione of England by Giovanni Sagredo, 1656, Razzell, *The English Revolution*, p. 19.
[391] Morrill (ed.), *Reactions*, p. 183.
[392] Worden, *The English Civil Wars*, p. 79.

rational scrutiny of all ritual and belief – but also the foundation for the process of rationalization analysed by Weber in his discussion of the protest ethic.

Religion became more radical over time, with lesser socio-economic groups coming to dominate the religious and political agenda. It ultimately led to a revolution which involved the trial and killing of the king, the abolition of the House of Lords and the establishment of a republic. This never had the support of the majority of the population, which objected to the control of a standing army and a culture of puritanism. Cromwell had attempted to establish a regime of military control through the Major-Generals, which was unsuccessful. He along with the army officers had also attempted to introduce various forms of parliament, including Barebones Parliament with an emphasis on M.Ps sympathetic to the Puritan cause. All these regimes unravelled partly on libertarian grounds – with the soldiers of the New Model insisting on a 'liberty of conscience'. According to Baxter

> many honest men [in the New Model Army] ... made it ... their religion to talk for this Opinion and for that; sometimes for State Democracy, and sometimes for Church Democracy; sometimes against Forms of Prayer, and sometimes against Infant baptism, (which yet some of them did maintain); sometimes against Set-times of Prayer, and against the tying of ourselves to any Duty before the Spirit move us ... and sometimes about Free-grace and free-will, and all the Points of Antinomianism and Arminianism ... But their most frequent and vehement Disputes were for Liberty of Conscience as they called it ... [393]

This range of views anticipated the growth of nearly all the dissenting congregations in England and Wales during the eighteenth and nineteenth centuries. This radical diversity of opinion made it difficult to find a religious and political settlement. The Presbyterians had attempted to impose a Puritan

[393] Baxter, *Reliquiare Baxterianae*, Part 1, p. 53.

settlement along Scottish lines, but with the overall control of parliament, but this was opposed by the New Model with its insistence on liberty of conscience, again reflecting an individualistic culture.[394]

It was perhaps because of these difficulties that led Crowell to eventually advocate a return to a conservative society. In a speech to parliament in 1654 he claimed that 'a nobleman, a gentleman, and a yeoman ... That is a good interest of the nation and a great one.'[395] It was because of this conservatism that he had suppressed the Leveller movement, including the imprisonment and execution of three soldiers at Burford in 1649.[396] Towards the end of his life Cromwell attempted to purge the army of radicals and introduce aristocrats into his personal circle. According to Lucy Hutchinson

> He weeded, in a few months' time, above a hundred and fifty godly officers out of the army, with whom many of the religious soldiers went off, and in their room abundance of the king's dissolute soldiers were entertained; and the army was almost changed from that godly religious army, whose valour God had crowned with triumph, into the dissolute army they had beaten, bearing yet a better name ... Claypole, who married his daughter, and his son Henry, were two debauched cavaliers ... His court was full of sin and vanity, and the more abominable, because they had not yet quite cast away the name of God ... hypocrisy became an epidemical disease ... At last he took upon himself to make lords and knights ... Then the Earl of Warwick's grandchild and the Lord Falconbridge married his two daughters ... [397]

However on the 15th March 1658 the Venetian ambassador reported that

---

[394] Razzell, *English Civil War,* Volume 3, p. 287; Underdown, *Revel*, pp. 208, 247.
[395] Coward, *Cromwell*, p. 102.
[396] See also Purkiss, *The English*, p. 499.
[397] Hutchinson, *Memoirs*, pp. 294, 295.

> ... the Army took very badly the cashiering of the officers, reported, and has made a vigorous remonstrance to the Protector, pointing out that officers cannot be dismissed from an army without a Council of War, and so, as they do not know for what reasons he sent away many of their colleagues, they ask him to restore them to their posts and, by order of His Highness, they have been reinstated in them a few days since ... [398]

Cromwell's attempted changes laid the foundation for the restoration of the crown and a traditional parliament, although many of the provincial members of the New Model Army continued to be attached to 'the Good Old Cause' and political radicalism. For example

> Even in Deal, (after the Restoration a great centre of Nonconformity) maypoles were set up on May day 1660, and the people set the King's flag on one of them to the fury of the soldiers in the castle who 'threatened, but durst not oppose.'[399]

Something similar occurred in Nottingham in 1660, when a confrontation occurred 'between the young men of the town who were demonstrating for the return of the king, and soldiers of Colonel Hacker's regiment. The Memoirs [of Lucy Hutchinson] tell us that 'the soldiers, provoked to rage, shot again and killed in the scuffle two Presbyterians ...'[400] By 1660 the general population had turned against the Cromwellian regime and the soldiers in Deal Castle were powerless to prevent this popular revolt.

Cromwell concluded before this period that a new constitutional settlement was necessary, and declared to an audience of army officers deeply opposed to change: 'It is the time to come to a settlement and lay aside arbitrary proceedings,

---

[398] Razzell, *English Civil War,* Volume 5, p. 83.
[399] M.V. Jones, *The Political History of the Parliamentary Boroughs of Kent, 1642-1662* (London University Ph. D. Thesis, 1967), pp. 467, 468.
[400] Jennings, *The Gathering*, p. 160.

so unacceptable to the nation.'[401] However, puritanism and a culture of individualism did not disappear, but was reflected in the rise of religious dissent and a more extensive development of capitalism. Both individualism and capitalism have come to shape modern England, which has dominated economic, social and political life in the twenty-first century.

[401] Coward, *Cromwell*, p. 146.

Chapter 5: Malthus: Mortality or Marriage? English Population Growth in the Eighteenth Century.[402]

Introduction

Malthus is the most important influence on thinking about the relationship between economic and demographic development. In his theoretical work, he emphasized the impact of economic factors on fertility and population levels, through shifts in the incidence of marriage. He had been influenced by Adam Smith, who had argued that 'the demand for men, like that for any other commodity, necessarily regulates the production of men; quickens it when it goes on too slowly, and stops it when it advances too fast.'[403] Malthus's work in turn influenced Ricardo, Marx, Marshall and other classical economists, who all assumed the primacy of economics over demography. The exception was Keynes, who accepted that population affected levels of aggregate demand – he was a strong admirer of Malthus – but had little or nothing to say about the impact of population growth on the supply side, in particular the supply of labour.[404]

Malthus's writings reflected the anxieties of his contemporaries in their concern to prevent a decline in their standard of living and economic privileges. His 'preventative' method applied particularly to the middle and upper classes, whereas the 'positive' checks were mainly applicable to the poor. Malthus's theory of population stressed the economic basis of marriage and fertility, with a growth in income leading to earlier marriage and a rise in fertility. However, there was a

[402] Unpublished paper.
[403] A. Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations*, Volume 1, p. 98.
[404] J.M. Keynes, *Essays in Biography (ed.) G. Keynes*, 2010; J.M. Keynes, *The Collected Writings of John Maynard Keynes, Volume 7*, 2012.

contradiction between his theoretical conclusions and his analysis of England's population history. Malthus attempted to engage with empirical evidence from parish registers and censuses, but given the unknown reliability of the raw data was forced to make arbitrary assumptions about correction ratios.[405] He also made theoretical statements which may have been correct for the time of writing, but were not accurate for an earlier period. For example, he wrote that 'the higher classes ... often want the inclination to marry, from the facility which they can indulge themselves in an illicit intercourse with the sex. And others are deterred from marrying by the idea of the expenses that they must retrench ...'[406] However, in the seventeenth century the aristocracy and other wealthy groups in England married almost universally and at a very young age.[407]

It is possible to construct from his writings on England an account similar to that in a demographic transition model. In this he emphasized the role of mortality rather than fertility in shaping changes in population levels:

> It would appear, by the present proportion of marriages, that the more rapid increase of population, supposed to have taken place since the year 1780, has arisen more from the diminution of deaths than the increase of the births.[408]

He elsewhere amplified this summary statement:

> … there is good reason to believe that not only in London, but the other towns in England, and probably also country villages, were at the time [the 1760s] ... less healthy than at present. Dr William Heberden remarks that the registers of the ten years from 1759 to 1768, from which Dr Price calculated the probabilities of life in

[405] T.R. Malthus, *An Essay on the Principle of Population*, 1826, pp. 404, 421, 427, 431.
[406] Ibid, p. 397.
[407] See T.H. Hollingsworth, 'The demography of the British peerage', *Population Studies*, Supplement Volume 18, 1965, and data later in this paper.
[408] T.R. Malthus, *An Essay on the Principle of Population*, 1803, p. 311.

> London, indicate a much greater degree of unhealthiness than the registers of late years. And the returns pursuant to the Population Act [of 1801], even after allowing for great omissions in the burials, exhibit in all our provincial towns, and in the country, a degree of healthiness much greater than had before been calculated ... The returns of the Population Act in 1811 ... showed ... a greatly improved healthiness of the people, notwithstanding the increase of the towns and the increased proportion of the population engaged in manufacturing employments.[409]

He concluded that disease environment played a critical role in shaping mortality levels: 'A married pair with the best constitutions, who lead the most regular and quiet life, seldom find that their children enjoy the same health in towns as in the country.'[410]

Malthus in his writings gave a sociological rather than an economic analysis of marriage: 'It is not ... among the higher ranks of society, that we have most reason to apprehend the too great frequency of marriage ... [it is] squalid poverty ... [which] prompt universally to early marriages ...'[411] He argued that the 'carelessness and want of frugality observable among the poor, so contrary to the disposition generally to be remarked among petty tradesmen and small farmers,'[412] and that

> poverty itself, which appears to be the great spur to industry, when it has once passed certain limits, almost ceases to operate. The indigence which is hopeless destroys all vigorous exertion … It is the hope of bettering our condition, and the fear of want, rather than want itself, that is the best stimulus to industry, and its' most constant and best directed efforts will almost invariably be found among a class of people above the class of the wretchedly poor.[413]

---

[409] T.R. Malthus, *An Essay on the Principle of Population*, 1989, Volume 1, pp. 256, 267.
[410] Ibid, p. 257.
[411] Ibid, p. 438; Volume 2, pp. 114, 150.
[412] Ibid, Volume 1, p. 359.
[413] Ibid, p. 439.

It was this emphasis on 'bettering our condition' that led Malthus to stress education as the best way of encouraging the postponement of marriage:

> .... to better the condition of the lower classes of society, our object should be to ... [cultivate] a spirit of independence, a decent pride, and a taste for cleanliness and comfort among the poor. These habits would be best inculcated by a system of general education and, when strongly fixed, would be the most powerful means of preventing their marrying ... [and] consequently raise them nearer to the middle classes of society.[414]

Malthus is expressing here the insight which has informed much of the literature on modern birth control practices: that education − particularly of women − combined with economic opportunity, is the most powerful way of encouraging fertility reduction.

His conclusion was that falling mortality had led to a reduction in the incidence of marriage:

> … the gradual diminution and almost total extinction of the plagues which so frequently visited Europe, in the seventeenth and the beginning of the eighteenth centuries, produced a change [in the incidence of marriage] … in this country [England] it is not to be doubted that the proportion of marriages has become smaller since the improvement of our towns, the less frequent returns of epidemics, and the adoption of habits of greater cleanliness.[415]

This was an early form of demographic transition theory, and in order to evaluate this argument, it is necessary to examine in detail England's demographic history in the eighteenth century.

---

[414] Ibid, Volume 2, p. 155.
[415] Ibid, Volume 2, p. 198. See also Ibid, Volume. 1, p.193 and Volume 2, p. 115.

The Reliability of Parish Registers

There is an element of uncertainty in all historical demographic measures, including local and regional variations. In the absence of reliable national data, it is necessary to adopt a methodology of the triangulation of data. This allows independent checking of all findings, important where these findings are unexpected and potentially controversial. An example of this is the finding that virtually all women were married in England during the seventeenth century, contradicting the theoretical notion of a European marriage pattern.[416] This conclusion was reached by using five different sources – censuses, church court depositions, burial registers, wills and family genealogies.[417] Likewise, the finding of the halving of adult mortality in the eighteenth century is based on the analysis of apprenticeship indentures, marriage registers, family genealogies, and data on elite groups such as Members of Parliament.[418]

The same methodological principle applies to the measurement of parish register reliability. Central to all discussion of population history before the introduction of civil registration in 1837 is the reliability of parish registers. Nine objective methods measuring burial register reliability are available, involving the triangulation of data.[419] The most important two methods are: (i) the same-name technique and (ii) the comparison of individual entries in probate and burial registers.

The same-name technique is based on a custom in England which gave the name of a dead child to a subsequent child of the same sex. Evidence from local censuses and other

---

[416] J. Hajnal, 'European marriage patterns in perspective' in D.V. Glass, D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography,* 1965, p. 101.

[417] P. Razzell, *Mortality, Marriage and Population Growth in England, 1550-1850*, 2016, pp. 60-70,

[418] Ibid, pp. 45-60.

[419] Ibid, pp. 15, 16.

listings suggests that there were no living children with the same names in individual families in the period 1676-1849.[420] However, according to probate data for different parts of England during the period 1600-1649 there were thirteen living same-name children out of a total of 2,144 – 0.6 per cent – although some of these children may have been step-siblings.[421]

Where two children of the same family were baptised with an identical name, it is therefore possible to measure the completeness of burial registration by searching for the first same-name child in the burial register. The technique can only be applied to families with at least two recorded baptisms of children of the same sex, but it is a valuable method of assessing the quality of burial registration.

The most important work on England's demographic history using parish registers is that carried out by E.A. Wrigley and colleagues of the Cambridge Group. Their main findings were that after a period of stagnation in the second half of the seventeenth and first half of the eighteenth century, population began to grow rapidly after the middle of the eighteenth century, with about two-thirds of the population increase due to a rise in

---

[420] Galley, Garrett, Davies and Reid initially argued that there were some living same-name English children enumerated in the 1695 Marriage Duty Census, but subsequently conceded that these same-name siblings were a consequence of transcription errors. C. Galley, E. Garrett, R. Davies, A. Reid, 'Living same-name siblings and English historical demography: a final comment', *Local Population Studies*, Number 88, 2012, p.82. See also C. Galley, E. Garrett, R. Davies, A. Reid, 'Living same-name siblings and English historical demography: a reply to Peter Razzell', *Local Population Studies*, Number 87, 2011; P. Razzell, 'Living same-name siblings in England, 1439-1851, *Local Population* Studies, Number 87, 2011; P. Razzell, 'Living same-name siblings in England, 1439-1851: a commentary', *Local Population* Studies, Number 88, 2012. Galley et.al successfully established that there were some living same-name children in Highland Scotland at this time, but all the research reviewed in this paper relates to English demographic experience.

[421] See P. Razzell, 'Living same-name siblings in England, 1439-1851, *Local Population Studies*, Number 87, 2011, p. 67 for a list of the places and dates involved.

fertility, and one third to decreasing mortality.[422] They have argued that the growth of population was mainly the result of the increase in fertility associated with a fall in the age of marriage, which in turn was due to growing real incomes lagged over time, a conclusion largely confirming the theoretical work of Malthus.

Because of deficiencies in parish registration, it was necessary to inflate the number of burials, baptisms, and marriages in order to establish reliable measures of deaths, births, and marriages. During the period in which the Cambridge Group's research was carried out there were no methods available to independently measure the reliability of inflation ratios. This was recognized by Wrigley et.al when they concluded that 'the lack of a reliable alternative data source makes it impossible ... to test effectively the completeness of Anglican registration', resulting in 'arbitrary' inflation ratios which can only be based on 'internal plausibility and internal consistency of the results obtained.'[423]

However there are now available new objective methods of measuring parish register reliability. The following table summarises a same-name analysis of 15 Cambridge Group reconstitution parishes during the period 1650-1837.

Table 1: Proportion of Untraced Same-Name Cases in 15 Cambridge Group Reconstitution Parishes, 1650-1837.[424]

Period	Total Number of Same-Name Cases	Number of Same-Name Cases Traced in Burial Registers	Proportion Of Untraced Cases
1650-99	1,160	873	24.7%
1700-49	1,533	1,246	18.7%
1750-99	1,227	903	26.4%
1800-37	907	705	22.3%

[422] E.A. Wrigley, R.S. Davies, J.E. Oeppen, R.S. Schofield, *English Population History from Family Reconstitution, 1580-1837*, 1997, p. 126.
[423] E.A. Wrigley, R.S. Schofield, *The Population History of England, 1541-1871*, 1989, p. 137; Wrigley, Davies, Oeppen, Schofield, *English Population*, pp. 91, 92.
[424] Source: Reconstitution data in Cambridge Group archive.

There appears to have been a slight improvement in burial registration reliability in the first half of the eighteenth century, although other data suggests no significant change in the period between 1650 and 1837.[425]

Research comparing probate with burial register data covering 147 parishes indicates that there were no significant changes in burial registration reliability in the parish register period.[426] The most detailed research available is on the county of Bedfordshire, where a study of all 124 parishes has been carried out.

Table 2: Proportion of Probate Cases Traced in 124 Bedfordshire Burial Registers, 1543-1849.[427]

Period of Probate	Total Number of Probate Cases	Proportion of Burials Untraced
1543-00	611	26%
1600-49	3731	21%
1650-99	4626	26%
1700-49	6030	23%
1750-99	3744	22%
1800-49	3303	27%
Total	22044	24%

Wrigley and Schofield had assumed in their aggregative research that other than defective periods, burial registration was perfect in the period leading up to the middle of the seventeenth century and only deteriorated significantly at the end of the eighteenth century.[428] This is reflected in the inflation ratios they used to

[425] Razzell, *Mortality*, pp. 18-23.

[426] Probate data tends to exclude the poorest members of a community, but data for Bedfordshire suggests that the poorest occupational group – labourers – experienced similar levels of burial under-registration as the rest of the population. P. Razzell, C. Spence, M. Woollard, 'The evaluation of Bedfordshire burial registration', *Local Population* Studies, Number 84, 2010, p.45.

[427] Source, Razzell, *Mortality*, p. 18.

[428] Wrigley, Schofield, *The Population*, p. 561.

translate burials into deaths which were as follows: 1540-99: 0%; 1600-49: 0%; 1650-99: 1.9%; 1700-49: 4.6%; 1750-99: 10.0%: 1800-39: 25.8%.[429] Data on same-name and probate/burial register research, indicates that approximately 25% of all burials were missing from parish registers in the period 1600-1837, with no clear linear trends in register reliability over time.

The absence of significant changes in burial register reliability is similar to the findings of research on baptism register accuracy. This involved research comparing information in censuses and baptism registers, including an evaluation of the quality of the census data through cross-matching censuses at different dates.[430] There was no linear trend found in the eighteenth century, with about 29 per cent of all births missing from the baptisms registers.[431]

Wrigley and Schofield's inflation ratios for baptisms in the period 1710-1836 are as follows: 1710-42: 11.5%; 1743-62: 13.9%; 1763-80: 16.4%; 1781-1800: 26.0%; 1801-20: 42.9%; 1821-36: 39.1%.[432] They assumed that birth under-registration was relatively low in the period 1710-80, but deteriorated sharply from the 1780s onwards, particularly after 1801. This assumed pattern is at variance with the findings outlined above, which essentially show no major changes in the eighteenth and early nineteenth century.

There is also evidence of a high level of marriage under-registration which is confirmed by Baker in his study of eighteenth century Cardington in Bedfordshire. He with colleagues attempted to trace both native and other adults who had migrated from all parts of the county, and found that 40.1% of baptisms, 31.5% of marriages and 24.9% of burials could not be traced in parish registers.[433] According to a range of evidence, this non-registration

---

[429] Ibid.
[430] P. Razzell, *Essays in English Population History*, 1994, pp. 84-89.
[431] Razzell, *Mortality*, pp. 22, 23.
[432] Wrigley, Schofield, *The Population*, pp. 541-44.
[433] D. Baker, *The Inhabitants of Cardington*, 1973, p. 18.

of births, marriages and deaths was mainly due to the negligence of clergyman and clerks in compiling parish registers.[434]

Wrigley and colleagues attempted to address the problems of parish register reliability by constructing a complex mathematical back projection model. The model suffers from a range of arbitrary assumptions, including the sharp inflation of baptisms and burials at the end of the eighteenth and beginning of the nineteenth century. Additionally, these models are very sensitive to changes in assumption. For example, as a part of their back projection programme, Wrigley and Schofield reduced the size of the age group 90-94 enumerated in the 1871 Census by 44%; if they had chosen instead to reduce this by 40%, their estimate of the English population in 1541 would have been 9% larger.[435]

Estimates of Population Growth

Given that there were no major changes in parish register unreliability in the parish register period, the most valuable data created by the Cambridge Group are the raw uncorrected national figures of baptisms, marriages and burials. These raw national figures provide the basis for the calculation of population changes in the eighteenth century, but with the assumption of zero net migration. For the purposes of this analysis, it is assumed that 29% of births and 28% of deaths went unregistered in the eighteenth century.[436] These figures are used as correction factors because

---

[434] Razzell, *Essays*, pp. 108-11.

[435] R. Lee, D. Lam, 'Age distribution adjustments for English censuses, 1821 to 1931', *Population Studies*, Volume 37, 1983, p. 446.

[436] These proportions are based on figures discussed previously, with about twenty-nine per cent of births missing from baptism registers in the eighteenth century. Approximately twenty-five per cent of deaths in same-name and probate parish samples were untraced in the period 1650-1837, but the number of untraced cases in urban areas appears to have been higher. For example the proportion of untraced cases in London and Liverpool in the period 1700-49 was significantly higher than elsewhere in the parish register period. P.

they yield appropriate population growth figures in the eighteenth century between the 1695 marriage duty census and the first national census of 1801. Applying these correction ratios to the raw national data yields the following population figures.

Table 3: Estimated Population Sizes of England, 1695-1801.[437]

	Births	Deaths			
Period	Baptisms x 100/71	Burials x 100/72	Births Minus Deaths	Population Date	Population Size
				1695	4632000
1695-99	1029677	951322	78355	1700	4710355
1700-09	2100998	1840774	260224	1710	4970579
1710-19	2079920	1922863	157057	1720	5127636
1720-29	2225579	2349728	-124149	1730	5003487
1730-39	2402912	2094161	308751	1740	5312238
1740-49	2306889	215421	155468	1750	5467706
1750-59	2437382	1999636	437746	1760	5905452
1760-69	260794	2280840	327064	1770	6232516
1770-79	2903273	2247785	655488	1780	6839889
1780-89	3085997	24788624	607373	1790	7447262
1790-99	3414119	2466510	947609	1800	8394871
1800-01	631897	528639	103258	1801	8498129

The estimated population figure for 1801 – 8,498,129 – is slightly smaller than the figure that Rickman calculated for 1801 – 8.561 million.[438] Given that the above estimates do not make any allowance for changes in migration levels, and that the population figure for 1695 is somewhat arbitrary, the data in Table 3 represent a plausible pattern of population growth in the eighteenth century.

Razzell, *Population and Disease: Transforming English Society, 1550-1850*, 2007, pp.134, 138.

[437] Source: Wrigley and Schofield, *The Population*, pp. 517-52, 577, 588. The population in the start date in 1695 is based on David Glass's reworking of Gregory King's estimate of population at that date.

[438] Ibid, p. 577.

The Table indicates that population diminished in the 1720s but increased gradually after that period, accelerating rapidly at the end of the eighteenth and beginning of the nineteenth century. The raw data suggests that it was a fall in mortality rather than a rise in fertility that was responsible for the increase in population.

Table 4: English Baptism and Burial Rates (Per 1000) in England Calculated from Cambridge Group Data.[439]

Period	Estimated Population	Baptism Rate	Burial Rate
1701-40	5160000 (1721)	30.4	28.7
1741-80	6054000 (1761)	30.3	25.9
1781-1820	8667000 (1801)	29.4	20.6

It is only because Wrigley and Schofield disproportionately inflated the number of baptisms in the period 1781-1820 that they concluded that there was a rise in the crude baptism rate in this period, and yet as we have seen the direct evidence on baptism registration reliability suggests that there were no significant changes in this period. Gregory King's work on the age structure of the English population in 1695 indicates it was very similar to that in 1821 based on national enumeration returns,[440] suggesting that there was no long-term change in age-specific fertility during this period.

Table 4 indicates that it was falling mortality that fuelled population growth, but in order to further clarify the exact demographic changes in the eighteenth century, it is necessary to consider in detail the empirical evidence on mortality, nuptiality and fertility in the parish register period.

---

[439] Source: Baptism and burial totals Wrigley, Schofield, *The Population*, pp. 541-44, 549-52; population figures taken from Table 3.

[440] D.V. Glass, D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography*, 1965, pp. 212-13.

The History of Infant and Child Mortality

Most studies of infant and child mortality have suffered from the lack of an objective method of measuring burial registration reliability.[441] The same-name method allows objective measurement, stating its procedures in advance and not making adjustments to resulting findings. I have used the technique for the analysis of 10 Cambridge reconstitution parishes, as well as in 15 rural parishes from other areas of England.[442]

[441]There are a number of historical studies of infant and child mortality which suffer from this difficulty. See R.E. Jones, 'Further evidence on the decline of infant mortality in pre-industrial England: north Shropshire, 1561-1810', *Population* Studies, Volume 34, 1980, pp. 239-50; J. Landers, 'London mortality in the long eighteenth century', *Medical History, Supplement Number 7*, 1991; R. Houston, 'Mortality in early modern Scotland: the life expectancy of advocates', *Continuity and Change*, Volume 7, 1992; P. Huck, 'Infant mortality in nine industrial parishes in northern England, 1813-36', *Population* Studies, Volume 48, 1994; M. Dobson, *Contours of Death and Disease in Early Modern England*, 1997; C. Galley, *The Demography of Early Modern Towns; York in the Sixteenth and Seventeenth Centuries*, 1998.

[442] Source: Reconstitution data in the Cambridge Group archive; parish registers in the Society of Genealogists library. Same-name correction ratios have been applied to raw IMR and CMR figures. The 10 Cambridge Group parishes are: Alcester; Aldenham; Austrey; Banbury; Bottesford; Colyton; Dawlish; Great Oakley; Ippleden; Morchard Bishop. The 16 rural parishes are: Ackworth; Ampthill; Arrington; Barton-in-the-Clay; Beeley; Breamore; Canewden; Cusop; Eaton Hastings; Kemerton; Sandy; Stow Maries; Truro; Weston Colville; Woodchurch; Youlgreave.

Table 5: Infant and Child (1-4) Mortality per 1000 in 10 Cambridge Group and 15 Rural Parishes, 1700-1837.

Period	Number of Infants at Risk	Number of Children at Risk	IMR	CMR
10 Cambridge Group Parishes				
1700-49	11933	8842	174	110
1750-99	12591	9897	148	97
1800-37	15462	9230	110	99
16 Rural Parishes				
1700-49	8332	5603	182	128
1750-99	9629	6950	150	126
1800-37	9375	6183	94	81

The pattern of mortality in the two samples is similar, although the reductions in mortality between 1700-49 and 1800-37 are greater in the rural areas than in the Cambridge Group sample. This may be partly a function of population size, as the mean population in 1801 of the Cambridge Group parishes was 1,349 and that of the rural sample 589. The average national mean size of the English population in 1801 was about 860,[443] and so the rural parishes are slightly more representative than the Cambridge Group ones.

From research on birth-baptism intervals and infant mortality, it is estimated that a maximum of 5% of children died before baptism in the period 1761-1834. However, many 'sickly' children were privately baptised, reducing mortality before baptism.[444] The infant mortality rates in both samples in 1800-37 were relatively low – 110/1000 and 94/1000 – and this may be partly a function of the exclusion of infants dying before

[443] Wrigley, Davies, Oeppen, Schofield, *English Population*, p. 20
[444] Razzell, *Essays,* pp. 106-07.

baptism. Woods estimated that the infant mortality rate in rural areas during the Victorian period was 97 per 1,000 as against 218 per 1,000 in urban areas, with a national average of 150 per 1,000.[445] He calculated the rural rate from data for Dorset, Hertfordshire and Wiltshire, southern counties like those forming the basis of the samples in Table 5. Similar consideration are likely to apply to child mortality rates, for although the child mortality rate for the age group 1-4 nationally in 1838-54 was 134 per 1,000,[446] it is likely to have been significantly less of that in rural areas, similar to that depicted in Table 5.

However, the sample sizes are small and are not necessarily representative of the whole country. They do not include any northern parishes or large towns, and under-represent industrial villages.[447] Infant and child mortality was much higher in large towns than in rural and provincial parishes in the seventeenth and eighteenth centuries. The infant and child mortality rates in 18 rural reconstitution parishes in 1650-1699 were 151/1000 and 106/1000 respectively; the equivalent rates in London, Norwich, Ipswich and Canterbury in a similar period were 304/1000 and 237/1000.[448] Urban infant and child mortality was twice of that in rural and provincial parishes in the late seventeenth century, but by the nineteenth century the average infant mortality rate in these urban areas had reduced to 179 per 1000.[449] However, there is some evidence to indicate that infant mortality grew in some urban and industrial parishes in the first half of the nineteenth century,[450] although the scale of

---

[445] Woods, 'Mortality', pp. 260-61.
[446] Register General Supplement, *45th Annual Report*, p. v
[447] A reconstitution study of Ackworth in Yorkshire for the period 1687-1812 indicates that the pattern of infant and child mortality was similar to that in Table 5, although at a somewhat lower level. The figures are as follows: 1687-1749: IMR: 166, CMR: 114; 1750-1812: IMR: 82, CMR: 77. Razzell, *Mortality,* p.34.
[448] Ibid.
[449] Ibid.
[450] W.A. Armstrong, 'The end of mortality in Carlisle between the 1780s and the 1840s: a demographic contribution to the standard of living debate',

reductions during the eighteenth century in the four urban parishes greatly outweighed the relatively modest increases in urban areas in the nineteenth century.

The pattern of infant and child mortality in the most important urban area – London – is indicated by the results of a reconstitution study of 16 City of London parishes in the period 1539-1849.

Table 6: Infant and Child (1-4) Mortality (Per 1000) in 16 London Parishes, 1650-1849.[451]

Period	IMR	CMR
1650-99	256	282
1700-49	409	176
1750-99	263	270
1800-49	141	118

Infant mortality increased significantly between 1650-99 and 1700-49, before falling very sharply after the middle of the eighteenth century. There was a similar pattern in child mortality, except for the rise in mortality in the second half of the eighteenth century.

Socio-Economic Status and Infant and Child Mortality

One further way of exploring the factors shaping infant and child mortality is to analyse the relationship between socio-economic status and mortality.

Economic History Review, Volume 34, 1981; P. Huck, 'Infant mortality in nine industrial parishes in northern England, 1813-36', *Population Studies,* Volume 48, 1994*;* S. Szreter, G. Mooney, 'Urbanization, mortality and the standard of living debate: new estimates of the expectation of life at birth in nineteenth century British cities', *Economic History Review*, Volume 51, 1998.

[451] Source: Razzell, *Population*, pp, 13, 134.

Table 7: Infant and Child (1-4) Mortality (Per 1,000) Amongst Elite and Control Families in 17 Cambridge Group Parishes, 1650-1799.[452]

Period	Elite Families		Control Families	
	IMR	CMR	IMR	CMR
1650-99	158	143	180	132
1700-49	177	106	223	146
1750-99	113	69	159	134

An elite family – gentlemen, professionals and merchants – was matched with the next control family in the baptism register, most of whom were artisans and labourers. There was little difference between the two groups in the late seventeenth century, but a sharp divergence thereafter, particularly in child mortality. Other sources indicate a variation in findings, although overall it would appear that these forms of early mortality reduced first amongst wealthy families and only later amongst the general population in the eighteenth century.[453]

Lower infant and child mortality levels amongst the wealthy continued throughout the nineteenth century,[454] although at significantly reduced levels than in the seventeenth century. However, areas with different socio-economic profiles showed if everything a reverse pattern. This can be illustrated with reference to London, where the Registrar-General provided data on mortality by registration sub-district. He classified districts by poverty levels as measured by average rateable value.

[452] Source: Razzell, *Mortality*, p. 37.
[453] Razzell, *Population,* pp. 91, 103-05, 111-12; 133; Razzell, *Mortality,* pp. 37-41.
[454] Razzell, *Population,* pp. 112-14.

Table 8: Infant, Child and Adult Mortality in London by Rateable Value of Registration District, 1839-44.[455]

Registration Districts	Mean Annual Value of Property	IMR	CMR	Adult (25-44) Male Mortality per 1000
10 Districts with Lowest Rateable Value	£15	153	52	13
10 Districts with Medium Rateable Value	£26	168	59	15
10 Districts with Highest Rateable Value	£58	167	58	13

Most of the poor districts were in the East End of London, and the wealthy ones in the West End.[456] The lack of an association between socio-economic status and infant mortality is supported by evidence on Quakers, who by the nineteenth century were mainly wealthy merchants and professionals. The infant mortality rate amongst Quakers in London in 1825-49 was 150 per 1000, similar to the rate amongst the total population in equivalent registration districts in 1838-44.[457]

These surprising findings are replicated in other districts of England. In the period 1851-60, mortality levels in the wealthy towns of Bath, Cheltenham, Richmond and Brighton were

[455] Source: Ibid, p. 136.
[456] Source: Ibid, p. 136.
[457] Razzell, *Population*, p. 137; Landers, 'London's mortality'.

significantly higher than in poorer districts in the same county.[458] The wealthy areas were towns, and the poorer areas rural districts, indicating that disease environment was more important in these instances than poverty in shaping mortality levels.[459]

To summarise, in rural and provincial areas infant mortally fell sharply between the first half of the eighteenth and nineteenth centuries, nearly halving in some areas. Child mortality in these districts was more stable, although there appears to have been a significant fall in some rural areas at the beginning of the nineteenth century. In London and in other urban districts there were marked falls in both infant and child mortality. Child mortality amongst the wealthy reduced in rural and provincial areas at an earlier period – from the beginning of the eighteenth century onwards – than it did among the general population.

It is less clear what the influence of socio-economic status was on urban infant and child mortality, and in London by the mid-nineteenth century there appears to have been little or no association between poverty and these forms of mortality. Also, as we have seen, in a number of provincial districts mortality was significantly lower in poor than in wealthy areas in the 1850s.

The general timing and extent of reductions in early childhood mortality cannot fully explain the scale of population increase in the eighteenth century. For a full explanation of this surge in population growth we must look elsewhere.

The History of Adult Mortality

There are a number of problems with the reconstitution study of adult mortality, in particular the unreliability of raw burial registration data. Only about ten per cent of the original sample can be included in the analysis, which is not likely to be socially

[458] Razzell, *Mortality*, p. 41

[459] See Woods *The Demography*, pp. 170-202 for an analysis of the mortality differences between urban and rural districts in this period.

or demographically representative of the total population.[460] There is also the difficulty of establishing accurate nominal record linkages between baptisms/marriages and subsequent burials, as most parish registers only list the names of people buried without further identifying information. There are however a number of sources which allow the direct measurement of adult mortality, the most important of which are: i. apprenticeship indenture records, and ii. marriage licences.

In the year 1710 the government introduced a national tax on apprenticeship indentures – the Inland Revenue Register (INR Register) – which was in existence until the early nineteenth century. Details of these indentures have survived and are currently being digitised by the Society of Genealogists.[461] The indentures in the early period provide the following information on fathers: name, place of residence, occupation, and whether or not they were alive or dead. Additionally the name of the apprentice was recorded along with the amount paid for the indenture.

A sample of 1,578 cases was selected from the national register, and data on the mortality status of fathers was established. It is estimated that a minimal annual mortality rate for England in 1710-13 was 20.9 per 1,000, which can be compared to figures published by the Registrar-General for a similar age group – 25-44 – in the period 1838-42 – 11 per 1000.[462] This indicates that male adult mortality approximately halved in the period between the early eighteenth and middle of the nineteenth century, a conclusion borne out by a number of other sources.[463]

Marriage licences are one of the most informative sources, covering between 30 and 90 per cent of the

---

[460] Razzell, *Mortality,* p. 43

[461] I would like to thank the Society of Genealogists for making available the digital version of the INR Register, covering the surnames beginning with the letters A to M.

[462] Mitchell and Deane, *Abstract*, p. 38

[463] Razzell, *Mortality,* pp. 45-56.

population.[464] For children under the age of 21, they required parental permission, and where a father was dead, permission of a widowed mother or guardian was required. The licences are available from the beginning of the seventeenth to the end of the eighteenth century, and an analysis of available licences yields the following results:

Table 9: Fathers of Spinsters under Twenty-One: Proportions Dead in English Regions, 1600-1799.[465]

Period of Marriage	London	South of England	East Kent Diocese	Durham Diocese
1600-46	46%	40%	47$	-
1661-99	47%	44%	43%	-
1700-09	46%	47%	50%	-
1710-19	47%	44%	48%	-
1720-29	45%	39%	48%	-
1730-39	46%	39%	34%	-
1740-49	55%	45%	37%	42%
1750-59	40%	41%	27%	28%
1760-69	35%	35%	22%	27%
1770-79	39%	31%	24%	29%
1780-89	31%	32%	28%	25%
1790-99	31%	27%	22%	-

According to this table, male adult mortality nearly halved in all regions in the eighteenth century.[466] As the figures relate to fathers who were alive on average nineteen years before the marriage of their daughters, mortality first began to fall in East Kent between 1710 and 1730, and in London, the South of England and Durham between 1730 and 1750.

According to Table 9 there were gains in life expectancy throughout the whole of the eighteenth century, although in East

[464] Razzell, *Population,* pp. 62, 63
[465] Source: Razzell, *Mortality,* p. 48.
[466] Ibid.

Kent most of this took place in the first half of the century. Other evidence indicates that reductions of mortality in Nottinghamshire also appear to have occurred mainly in this period, with the estimated paternal death rate falling from 22 per 1,000 in 1661-63 to 14 per 1,000 in 1754-58 and 10 per 1,000 in 1791-93.[467]

However data on the fathers of masons' apprentices who lived in all areas of the country suggests paternal mortality fell equally in the first and second halves of the century.

Table 10: Mortality amongst Fathers of London Indentured Masons' Apprentices.[468]

Date of Indenture	Number of Fathers Dead	Total Number of Fathers	Proportion of Fathers Dead
1663-99	94	223	42%
1700-49	124	375	33%
1750-1805	43	202	21%

Approximately four-fifths of these fathers lived outside London, residing in every county and country of Great Britain.

Evidence from the marriage licences and apprenticeship indentures suggest that adult mortality was higher amongst the wealthy than the poor, and this may have been the case until the end of the nineteenth century.[469] This was probably due to the 'hazards of wealth' – the consumption of very rich food and alcoholic drinks, and a relative lack of exercise – as well as the result of avoiding childhood infections such as smallpox, which took their toll in adulthood.[470]

However, this reverse socio-economic gradient appears to have been established in the eighteenth century, as revealed by the association between occupation and mortality in East Kent during the period between 1619-46 and 1751-1809.

---

[467] Ibid, p. 49.
[468] Source: C. Webb, *London Bawdy Courts, 1703-13,* 1999.
[469] Razzell, *Population,* pp. 197-226.
[470] J.C. Riley, *The Eighteenth Century Campaign to Avoid Disease*, 1987.

Table 11: Proportion of Dead Fathers of Spinsters Marrying Under 21, by Occupation of Husband in East Kent, 1619-1809.[471]

Occupation	Period		
	1619-46	1661-1700	1751-1809
Gentlemen, Merchants & Professionals	39%	38%	28%
Yeomen & Farmers	41%	42%	15%
Tradesmen & Artisans	46%	49%	26%
Husbandmen	50%	39%	19%
Mariners & Fishermen	42%	45%	24%

Mortality declined significantly during the eighteenth century, approximately halving in most occupational groups. In the seventeenth century gentlemen, merchants and professionals appear to have lower mortality than other groups, but by 1751-1809 the position had been reversed, with this elite group having the smallest reduction in mortality.

However, there is very detailed evidence of the gains in adult life expectancy amongst wealthy Members of Parliament and the aristocracy. The former data allows a very detailed breakdown of men of different ages living in all areas of England.

Table 12: Mean Number of Years Lived by Members of Parliament, 1660-1820 (Number of Cases in Brackets).[472]

Period of First Entry	Age at First Entry - Mean Number of Years Lived		
	Under 29 Years	30-39 Years	40 Years Plus
1660-1690	25.7 (429)	22.5 (458)	17.9 (633)
1715-1754	30.1 (541)	28.2 (422)	18.5 (347)
1755-1789	37.1 (480)	29.9(354)	21.2 (431)
1790-1820	38.1 (571)	32.0 (432)	22.4 (572)

[471] Source: Razzell, *Essays,* p. 197. For higher paternal mortality amongst gentlemen and professionals than in other groups in Nottinghamshire and Sussex during 1754-1800 see Razzell, *Population*, p. 117.
[472] Source: Razzell, *Essays,* p. 199.

All age groups experienced mortality reductions, but the greatest mortality gains were amongst the youngest age cohort under the age of 29. There was an increase in life expectancy of over 12 years in this group, distributed evenly in the entry period between 1660 and 1789. There were also substantial gains in the 30-39 age cohort – of about 10 years – but these were mainly confined to the entry period between 1660 and 1754. There was a modest increase in life expectancy of nearly 5 years in the oldest 40+ group, which was fairly evenly spread between 1660 and 1820. The above pattern of adult mortality is similar to that found by Hollingsworth in his study of the aristocracy.[473] Although all the evidence considered on adult mortality is for males, his study of the aristocracy suggests that females experienced even more mortality reductions in the eighteenth century.[474]

The timing of the reduction in adult mortality was different from the falls in infant and child mortality which appear to have occurred mainly in the second half of the eighteenth century, and given that life table models assume that infant/child and adult mortality move in the same direction, this suggests that these models are not a reliable basis for understanding eighteenth century mortality trends. The Cambridge Group have used such models in calculating figures of adult mortality, but different assumptions may have been one of the reasons why their figures have changed significantly in recent years. In 1997 Wrigley et.al published life expectancy figures for men aged twenty-five as follows: 1640-89: 30.4 years; 1750-1809: 35.4 years.[475] More recently in 2004, Wrigley has claimed that 'reconstitution data suggest that adult mortality moved from the equivalent of level 5 in model North in the period 1640-89 to the equivalent of level 9 in 1750-1809, or a rise of 10 years.'[476] The latter figure represents a very significant increase over earlier estimates, and

[473] Hollingsworth, *The Demography*, p. 56
[474] Ibid, p. 57.
[475] Wrigley, Davies, Oeppen, Schofield, *English Population*, p. 291.
[476] E.A. Wrigley, *Poverty, Progress and Population*, 2004, pp. 427, 428

is now compatible with the marriage licence and other data reviewed earlier.[477] Wrigley concluded that 'there seems little reason to suppose that the evidence relating to male adult mortality drawn from marriage licences and that drawn from reconstitution are at odds'[478], representing a welcome new consensus.

Explaining Mortality Reductions

The factors responsible for mortality levels are complex. For example, smallpox became much more virulent between the sixteenth and nineteenth century: case fatality rates amongst unprotected children in London rose from about 5% to 45% in this three hundred year period. It is possible that the increasing fatality of smallpox was the result of the importation of more virulent strains with the growth of world trade. It was only the practice of inoculation and vaccination that prevented the disease from destroying a large part of the population.[479] Smallpox also varied in its age incidence between different areas of the country: in the South of England it was a disease of both adults and children, whereas in the North and elsewhere it affected mainly young children. This is important as case-fatality rates differed markedly between different age groups.[480]

To some extent, disease had its own internal logic, so that for example the disappearance of the plague in England in the 1660s does not appear to be the result of any environmental or other improvements. However, it is known that environmental factors did influence the incidence of disease. Mortality was higher in marshland areas, in industrial and urban districts, in

---

[477] According to calculations prepared by Jim Oeppen using the East Kent marriage licence data, there was an increase of 9 years in life expectancy at age 25 between 1650-99 and 1750-1800. Razzell, *Essays*, p. 201.
[478] Wrigley, *Poverty*, p. 431.
[479] P. Razzell, *The Conquest of Smallpox*, 2003.
[480] Ibid, pp. xi-xix.

certain coastal and estuarine regions, and lower in isolated rural areas with the right geographical and ecological characteristics.[481]

It is possible that the lower levels of infant mortality amongst the wealthier socio-economic groups in Table 7 are partly a function of wealth, although falling elite mortality in the second half of the eighteenth century suggests that non-economic factors were responsible.[482] The rapid fall in child mortality in elite families in the eighteenth century, at a time when it was stable amongst the control population, indicates that this reduction of mortality was exogenous to economic development. Also, the lack of an association between socio-economic status and child mortality in the mid-nineteenth century depicted in Table 8 and found elsewhere, suggests that disease environment rather than poverty was the most important factor in shaping the level of mortality.

The explanations of these trends are complex: the wealthy are known to have fled London and other towns during the plague, to have escaped childhood diseases such as smallpox by moving away from areas known to be affected by the disease, and to have avoided marsh areas known to suffer from endemic malaria.[483] It is possible among other factors that by the mid-nineteenth century the avoidance of disease was no longer important in protecting wealthy groups from infection, particularly when they lived in urban areas. The falls in infant mortality in rural and provincial parishes from the middle of the eighteenth century may have been in part due to an autonomous reduction in disease incidence,[484] as well as the result of a variety of health improvements. These included better breastfeeding practices, inoculation/vaccination against smallpox, and

---

[481] Dobson, *Contours*; Razzell, *Population,* pp. 98, 99.

[482] Also, the level of infant mortality in Bedfordshire was higher amongst the elite than the control population in 1700-49. See Razzell, *Population*, p. 133.

[483] Riley, *The Eighteenth Century*; Dobson, *Contours.*

[484] J.D. Chambers, *Population, Economy and Society in Pre-Industrial England*, 1972.

improved personal and domestic hygiene,[485] linked to growing literacy amongst women.

The dramatic reduction of infant mortality in London was also probably a result of major improvements in public health – increased water supplies, better drainage, and rebuilding of the urban landscape – as well as much better maternal and neo-natal care.[486]

Although most of these measures were not the result of economic developments, clearly economic change did have an indirect influence on mortality. Agricultural improvements led to the drainage of marshland which may have contributed to the elimination of malaria,[487] and the production of cheap cotton cloth enabled working class families to improve their standard of personal hygiene. There was also an economic element in some of the other factors responsible for mortality decline: for example, the rebuilding of houses and house floors in brick and stone. The increasing use of coal enabled water to be boiled more easily, important for personal and domestic hygiene.[488] However, elite social groups had always had the economic resources necessary for these improvements, and the majority of them probably resulted from new attitudes towards disease, personal hygiene and the environment.[489] These changes in attitude and

---

[485] E.L. Jones, M.E. Falkus, 'Urban improvement and the English economy in the seventeenth and eighteenth centuries' in P. Borsay 'Cleaning up the Great Wen: public health in eighteenth century London', in W.F. Bynum, R. Porter (eds.), *Living and Dying in London: Medical History Supplement*, Number 11, 1991; Razzell *Essays*, pp. 224-29; Razzell, *The Conquest.*

[486] M.D. George, *London Life in the Eighteenth Century*, 1966, p. 61; I. Loudon, *Death in Childbirth: an International Study of Maternal Care and Maternal Mortality, 1800-1950*, 1992; I. Loudon, *The Tragedy of Childbed Fever*, 2000, p.61.

[487] Dobson, *Contours*.

[488] I would like to thank Tony Wrigley for pointing out the potential importance of coal in boiling water for improving personal hygiene. For the use of boiling water and milk in preventing infant diseases see I. Marks and M. Worboys, *Migrants, Minorities and Health,* 1997, p. 192.

[489] This shift in attitudes was partly associated with the eighteenth century enlightenment movement. The Royal Society's statistical investigation in the

belief appear to have first influenced the educated and wealthy, and gradually spread to the general population later in the eighteenth and nineteenth centuries.

However, the reduction in adult mortality occurred more-or-less equally amongst all areas of the country and in all socio-economic groups, suggesting that there was an 'autonomous' fall in the adult death rate from the early eighteenth century onwards.[490]

The History of Nuptiality and Fertility

The Cambridge Group data in Table 5 suggest that there was no long-term rise in fertility in the eighteenth century, as there were no significant changes in baptism registration reliability or changes in the age structure of the national population. However, the factors shaping fertility are complex and need to be examined in some detail. The Cambridge Group found from their reconstitution research that there was a decline of about two-and-a-half years in the average age of marriage of spinsters during this period.[491] This finding is somewhat contradicted by data from marriage licences – which indicate that average age of marriage rose by about a year in the eighteenth century – but these licences tended to exclude the poorest socio-economic groups.[492]

There is a difficulty with reconstitution calculation of marriage ages. Marriage registers in the early period rarely give information on the marital status of grooms or brides, and there was a major shift in marital status during the eighteenth century.

1720s into the effectiveness of inoculation − comparing natural smallpox mortality with that amongst the inoculated − is perhaps the first historical example of a scientific assessment of a medical treatment. Razzell, *The Conquest*, pp. 172-74.

[490] Chambers, *Population*.

[491] Wrigley, Davies, Oeppen, Schofield, *English Population*, p. 149.

[492] Chambers, *Population*.

[492] Razzell, *Mortality,* p. 71.

Wrigley and Schofield concluded that 'perhaps as many as 30 per cent of all those marrying were widows or widowers in the mid sixteenth century … By the mid nineteenth century, in contrast, it is clear from civil registration returns that a comparable proportion was much lower at 11.27 per cent.'[493] Marriage Licence data confirm this conclusion, but it represents a problem for reconstitution research on marriage ages. During the late seventeenth century about 26 per cent of spinsters in East Kent married widowers, and on average they married 3.8 years later than spinsters marrying bachelors.[494] A twenty per cent reduction in the number of widower marriages would lead to a fall of 0.76 years – 3.8 x 1/5 – in the overall marriage age of spinsters, and this would be the result of the changing marital status of grooms and brides during this transition period.

Nevertheless, new evidence suggests that the fall in the average marriage age of spinsters found by the Cambridge Group is largely genuine. Although there is a lack of reliable national data, marriage licences indicate that there was a radical shift in the relative ages at which the wealthy and the poor married in the seventeenth and eighteenth centuries. In Nottinghamshire and Gloucestershire during the seventeenth century the average age of spinsters marrying labourers and husbandmen was over 26 years, whereas the average for yeomen, gentlemen and professionals was between 22 and 24 years.[495] These figures include spinsters marrying both bachelors and widowers, but an analysis of the 100 first cases of spinsters marrying bachelors reveals a similar pattern:

[493] Wrigley and Schofield, *The Population*, pp. 258, 259.
[494] Razzell, *Population,* p. 131.
[495] Ibid, pp. 242-43.

Table 13: Marriage Ages of Spinsters Marrying Bachelors in the Diocese of Nottinghamshire, 1672-1685.[496]

Gentlemen & Professionals	Yeomen	Artisans & Tradesmen	Labourers
Mean = 23.0 Years	Mean = 23.5 Years	Mean = 24.1 Years	Mean = 25.2 Years
Proportion Under 21 = 29%	Proportion Under 21 = 23%	Proportion Under 21 = 9%	Proportion Under 21 = 5%

The high marriage age of spinsters marrying labourers is confirmed by a reconstitution study of their marriages occurring in Bedfordshire in the period 1650-1749. It was possible to trace 77 marriages in the baptism register, yielding a mean age at marriage of 26.7 years with 18 per cent marrying under the age of 21.[497] The mean age is higher than that listed in Table 13 for labourers, and this may be because it included marriages to widowers as well as bachelors.

A transition in this pattern occurred in the eighteenth century and was very marked in the Archdeaconary of Chichester, as revealed by the proportions of spinsters marrying under the age of 21:

Table 14: Proportion of Spinsters Marrying Under 21 in the Archdeaconary of Chichester, Sussex, 1754-1799.[498]

Period	Labourers		Yeomen, Gentlemen & Professionals	
	Number	% Under 21	Number	% Under 21
1754-69	142	9%	142	22%
1770-99	163	25%	163	14%

[496] Source: T.M. Blagg, F.A. Wadsworth (eds.), *Abstracts of Nottinghamshire Marriage Licences 1577-1700,* 1930.

[497] The analysis was carried out on data in the Bedfordshire Family History Database covering 124 parishes in the county, selecting all marriages where the groom was listed as a labourer and the bride as a spinster.

[498] Source: Razzell, *Population,* p. 244.

By the nineteenth century there were significant differences in marriage ages between these socio-economic groups. Marriage ages were sometimes included in civil registration returns, and an analysis of Surrey and Bedfordshire parishes where such information was recorded, yielded the following differences.

Table 15: Marriages of Brides Marrying Bachelors in Surrey and Bedfordshire, 1837-71.[499]

Occupation	Brides Signing The Marriage Register	Age At Marriage (Years)	Proportion Marrying Under 21
Surrey			
Labourers	68.0%	23.0	31.4%
Artisans & Tradesmen	90.0%	24.4	17.2%
Farmers	96.0%	26.1	12.9%
Elite Occupations	99.4%	25.3	17.8%
Bedfordshire			
Labourers	34.2%	22.2	37.6%
Artisans & Tradesmen	67.0%	23.0	26.4%
Farmers	83.3%	25.1	10.5%
Elite Occupations	100%	27.8	15.8%

[499] Source: Marriage civil registers in the Surrey and Bedfordshire Record Offices. The marriages were selected from parishes in alphabetical sequence up to the parish of Ham in Surrey and Potsgrove in Bedfordshire for the period 1837-71. The numbers of marriages in the calculation of marriage ages were as follows: Surrey: labourers: 1,759; artisans & tradesmen: 2,039; farmers: 102; elite occupations (gentlemen, professionals & merchants): 102. Bedfordshire: labourers: 1,955; artisans & tradesmen: 1,268; farmers: 102; elite occupations: 38.

There was approximately a three year difference in the mean age of marriage between labourers and farmers/elite occupations, with artisans and tradesmen occupying an intermediate position. There were similar differences in marriage ages of spinsters in England & Wales in 1884-85. The mean age of brides marrying bachelor labourers was 23.7 years, farmers 28.9 years, and professionals 26.4 years.[500] This is the reverse to what was found in the seventeenth century, as a result of labourers' marriage ages falling significantly and those of elite occupations rising during the eighteenth and early nineteenth centuries.

This was the socio-economic pattern of marriage described by Malthus, with the poor marrying at a much earlier age than the wealthy. He was born in the parish of Wotton, Surrey, where in later life he became curate, and his family home was in the neighbouring village of Albury.[501] He was very familiar with the marriages of the poor of these parishes, as well as the marriage habits of his wealthier contemporaries. It is probable that reduced adult mortality led to the rich to marrying much later, contrasted with the poor marrying much earlier as a result of pauperisation.[502] The artisan and tradesmen class appear to

---

[500] Woods *The Demography*, p. 86.

[501] P. James, *Population Malthus: His Life and Times*, 1979, pp. 13, 34, 40.

[502] As we saw earlier, Malthus stressed the link in England between poverty and early marriage. There is no consensus on patterns of real income and economic inequality in the eighteenth and early nineteenth century. For example, see G. Clark, 'The long march of history: farm wages, population, and economic growth, England 1209-1869' *Economic History Review*, Volume 6, 2007; G. Clark, 'The consumer revolution: turning point in human history, or statistical artifact', *Department of Economics, University of California, Davis, Working Paper*, 2010; S. Broadberry, B.M.S. Campbell, A. Klein, M. Overton, B. Van Leewen, *British Economic Growth, 1270-1870*, 2015. However, the increasing pauperisation of labourers at the end of the eighteenth and beginning of the nineteenth century was described by nearly all contemporaries, including Horatio Nelson. See N.H. Nicolas, *The Dispatches and Letters of Vice Admiral Lord Viscount Nelson, Volume 1, 1777-94*, 1845, p. 295. See also J. Howlett, *Examination of Mr Pitt's Speech in the House of Commons ... February 12th, Relative to the Condition of the Poor*, 1796; D.

have occupied an intermediate position, with little change in their marriage ages. However, the frequency of marriage was also a major determinant of fertility, and as Wrigley and colleagues have concluded 'until the middle of the eighteenth century the substantial swings in nuptiality were produced almost exclusively by wide variations in the proportion of women never marrying.'[503]

There is now evidence that marriage was nearly universal in the seventeenth century. Shepard and Spicksley have compiled data from church court depositions covering nearly all areas of England, showing that only about 3 per cent of women aged above 45 were single at the beginning of the seventeenth century.[504] Information from a range of other sources – censuses, church court deposition, burial registers, wills and family genealogies – confirm this conclusion.[505] This changed during the eighteenth century as illustrated by data for the London Consistory Court.

Davies, *The Case of Labourers in Husbandry*, 1796*;* W. Cobbett, *Rural Rides*, 2001; J. and B. Hammond, *The Village Labourer,* 1911; J. and B. Hammond, *The Town Labourer,* 1917; J. and B. Hammond, *The Skilled Labourer,* 1919; G. Taylor, *The Problem of Poverty,* 1969*;* B. Inglis, *Poverty and the Industrial Revolution,* 1972*;* E.P. Thompson, *The Making of the English Working Class,* 1980; D. Vincent, *Bread, Knowledge and Freedom: a Study of Nineteenth Century Working Class Autobiography,* 1981*;* J. Humphries, 'The lure of aggregates and the pitfalls of the patriarchal perspective: a critique of the high wage interpretation of the British industrial revolution', *Economic History Review*, Volume 66, 2013.

[503] Wrigley and Schofield, *The Population*, p. xix.

[504] Razzell, *Mortality*, p. 65.

[505] Ibid, pp. 60-70.

Table 16: Proportion of Female Deponents Single in the London Consistory Court, 1583-1817.[506]

Period	Age Group – Proportion Single			
	15-24	25-34	35-44	45+
1586-1611	62%	15%	1%	0%
1703-1713	72%	25%	7%	4%
1752-1783	77%	43%	14%	5%
1792-1817	76%	53%	13%	15%

There were significant reductions in the frequency of marriage in all age groups during the eighteenth century, and this was also the case in Yorkshire and other areas of England.[507] The explanations for this trend are complex but it appears that it occurred particularly amongst the wealthy and the well-educated.[508] There were major changes in literacy levels amongst wealthy women in the eighteenth century, as illustrated by the proportion of women signing wills in London.

Table 17: Proportion of Women Signing London Wills, 1599-1851.[509]

Period	Proportion Signing Wills	Number Of Cases
1599-1601	2%	100
1639-1641	15%	100
1699-1701	38%	100
1749-1751	64%	100
1799-1801	77%	100
1849-1851	86%	100

[506] Source: Ibid, p. 67.
[507] Ibid, pp. 60-70. Recently Szreter and Garrett have argued that there was a decline in the frequency of marriage from the middle of the eighteenth century onwards. S. Szreter, E. Garrett, 'Reproduction, compositional demography, and economic growth: family planning in England before the fertility decline', *Population and Development Review,* 2000, p. 67.
[508] Razzell, *Mortality,* pp. 74-77.
[509] Source: Ibid, p. 86. The figures are based on the first 100 women leaving wills selected alphabetically in the periods in question.

However, literacy was not a sufficient condition to sustain a single marital status, as in the late eighteenth century many of the poor were literate but with very high levels of marriage frequency.[510] It was important to have the economic resources to be able to sustain a single marital status, although these are complex issues requiring further clarification.

The socio-economic patterns of marriage age and the frequency of marriage had a direct impact on fertility levels. The general relationship between status and fertility was widely recognised by contemporaries in the nineteenth century, summarized by Wrong as follows:

> In England most of the writers who took part in the Malthusian controversy in the early part of the nineteenth century were full aware of the existence of a negative relationship between fertility and socio-economic status. It was referred to by Malthus himself, by William Godwin, John Stuart Mill, Harriet Martineau, and Nassau Senior, to mention only a few of the better know intellectual figures of the day.[511]

Glass was the first to analyse the relationship between socio-economic status and fertility which occurred in the middle of the nineteenth century. He found a strong correlation between the social status of a London registration district and its gross reproduction rate in the period 1849-51, even allowing for the presence of servants.[512] There were similar associations in other wealthy and poor districts, with the wealthy areas having higher literacy and lower fertility rates.[513] Data for Bedfordshire indicates that fertility was particularly high amongst labourers compared to other occupational groups:

---

[510] Ibid, pp. 75-77.
[511] J. Wrong, 'Class fertility differentials before 1850', *Social Research*, Volume 25, 1958, p. 67.
[512] D.V. Glass, 'Fertility and economic status in London', *Eugenics Review*, Volume 30, 1938, p. 118.
[513] Razzell, *Mortality*, pp. 81-83.

Table 18: Bedfordshire Baptism Fertility Rates, 1849-51.[514]

Occupation	Number Of Baptisms	Number Of Men Living Aged 20-50 In 1851	Annual Fertility Rate Per 1000 Living
Labourers	5280	10887	16.2
Artisans, Tradesmen & Others	3008	11120	9.0
Farmers	294	1148	8.5

The findings on status and fertility are consistent with the evidence on the relationship between status and marriage previously discussed. The overall impact of marriage patterns and fertility levels is more difficult to assess. The falling mean age of marriage amongst labourers – and they formed a large part of the total population – has to be contrasted with the declining frequency of marriage amongst other groups. The best evidence on changing fertility levels in the eighteenth century is provided by Table 4, which indicates that there was no significant change during this period, suggesting that the decline in mean marriage age was balanced by an overall reduction in the frequency of marriage.

Conclusion

Contrary to his well-known theory, Malthus presented evidence to show that population growth in eighteenth century England was largely caused by falling mortality rather than rising fertility, and that the frequency of marriage diminished as a result of this reduced mortality. This was an early form of the demographic transition theory, and data is produced in this paper to confirm

[514] Source: Ibid, p. 84.

this conclusion. Adult mortality approximately halved from the beginning to the end of the century, with reductions occurring amongst all socio-economic groups and in all areas of the country. Infant and child mortality fell at a later date from the middle of the eighteenth century onwards, reducing first amongst the wealthy.

New evidence suggests that nearly all women were married in the seventeenth century, contradicting Hajnal's theoretical notion of a European marriage pattern. As predicted by Malthus, the reduction in mortality led to a fall in the incidence of marriage. The proportion of married women diminished during the eighteenth century in all age groups, particularly amongst the wealthy and literate, linked to a major increase in female literacy. This was counter-balanced by a decrease in the mean age at marriage amongst the poor, compared to an increasing age of marriage amongst the wealthy. The net effect of these developments was the stabilisation of fertility.

It is argued that the reduction in mortality was largely independent of economic growth. The fall in mortality probably resulted from an autonomous reduction in disease virulence, along with a number of medical innovations and an improvement in personal and public hygiene.

A detailed review of the evidence on England's population growth in the eighteenth century indicates that it was Malthus's more empirical analysis rather than his theoretical arguments that were valid for this period. It was a time in which a demographic transition was taking place, with mortality falling largely as a result of changes in the disease environment. Adult mortality approximately halved amongst all socio-economic groups and in all areas of the country from the early eighteenth century onwards, confirming Malthus's analysis. However, infant and child mortality reduced from the middle of the eighteenth century which is not consistent with Malthus's prediction of a decline of infectious diseases at the beginning of the century. These forms of mortality first reduced amongst the wealthy,

suggesting that economic factors were not primary in shaping these mortality patterns.

Also as predicted by Malthus, there was a significant reduction in the incidence of marriage. There were also changes in the age of marriage, with the wealthy and middle classes marrying at a significantly later date, and the poor marrying at an increasingly earlier age. It appears that labourers and the poor suffered increasing pauperisation resulting from growing life expectancy and population numbers, leading to demoralization and early marriage. The later marriage of the wealthy and middle classes was probably largely the result of reduced mortality, although there is evidence that the growing education and literacy of women may have also played a role. This is similar to findings about the influence of women's education on fertility levels in developing countries in the twentieth century.

New research indicates that nearly all women were married in the seventeenth century, contradicting Hajnal's notion of a European marriage pattern. This changed in the eighteenth century particularly amongst the elite, and combined with shifts in class based marriage ages, this resulted in a significant socio-economic gradient in fertility levels in the first half of the nineteenth century. As with marriage ages the incidence of marriage was probably linked to the growing literacy of women.

This is consistent with demographic transition theory, different from Malthus's theoretical arguments about the relationship between economic development and population growth for which he is famous. The transformation of mortality levels without significant economic development is similar to the twentieth century experience of poor countries such as Sri Lanka, Cuba, Kerala, Costa Rica and Albania.[515] Although the

[515] S.B. Halstead, J.A. Walsh, K. S. Warren, *Good Health at Low Cost*, 1985; J. Caldwell, 'Routes to low mortality in poor countries', *Population and Development Review*, Volume 12, 1986; A. Gjonca, *The Paradox of Mortality Transition in Albania, 1950-90*, 1991; R.A. Easterlin, 'How beneficent is the market? A look at the modern history of mortality', *European Review of Economic History*, Volume 3, 1999; D.M. Cutler, A.S. Deaton, A. Llera-

Cambridge Group has argued that Malthus's theoretical arguments are largely valid for England in the eighteenth century, the evidence reviewed in this paper indicates that it was diminishing mortality rather than increasing fertility that was the prime reason for population growth in this period.

Demography has been seen traditionally by economists and other social scientists as a function of economics, but the evidence presented in this paper shows that population has acted in England during the eighteenth century largely through changes in disease patterns as an independent force in helping to shape England's economic and social history.

Muney, 'The determinants of mortality', *Journal of Economic Perspectives*, Volume 20, 2006; R.A. Easterlin, 'Cross sections are history' *Population and Development Review*, Volume 38, 2012.

Chapter 6: The History of Infant, Child and Adult Mortality in London, 1538-1850.[516]

Introduction

It is widely accepted that London's population growth since the sixteenth century has had a significant impact on its economic and social development, influencing not only the supply of labour but also the demand for a range of goods and services, including housing and the urban infrastructure.[517] It has also been generally assumed that because of its high level of mortality before the nineteenth century, most of London's growth was brought about by migration rather than endogenous population increase.[518] Furthermore, it has been widely believed that there was a close association between poverty and all forms of mortality from at least the sixteenth century onwards.[519] However, many of these assumptions remain untested due to the lack of reliable evidence as a result of inadequate source material.

Most previous research on London's demographic history has been based on the Bills of Mortality,[520] although

---

[516] Written jointly with Christine Spence and published in *The London Journal,* Volume 32, Issue 3, 2007.

[517] V. Harding, 'Early modern London 1550-1750', *London Journal*, Volume 20, 1995, p. 36; L. Schwarz, 'London, 1700-1850', *London Journal*, Volume 20, 1995; L. Schwarz, *London in the Age of Industrialisation: Entrepreneurs, Labour Force and Living Conditions,* 1992.

[518] Harding, 'Early modern London', p. 36

[519] R. Finlay, *Population and the Metropolis, the Demography of London, 1580-1640*, 1981; Harding, 'Early modern London', p. 39; B. Luckin 'Perspectives on the mortality decline in London, 1860-1920', *London Journal*, Volume 22, 1997; R. Woods, 'Mortality, poverty and environment' in R. Woods, J. Woodward (eds.), *Urban Disease and Mortality*, 1984, p. 24.

[520] See for example J. Brownlee, 'The health of London in the eighteenth century', *Proceedings of the Royal British Medical Society*, Volume 18, 1925; A.B. Appleby, 'Nutrition and disease: the case of London, 1550-1750',

the reliability of this source has been subject to much criticism.[521] There is also the problem that the Bills only allow an aggregative study of London's population history, whereas much modern demographic research focuses on individual families enabling a more detailed study of a range of variables.[522] We have attempted to address these issues by creating family-level data, and assessing the quality of these data through detailed methodological analysis.

The present paper concentrates on the history of mortality, seeking to establish changing levels of mortality in the period between the middle of the sixteenth and nineteenth centuries. Parish registers, guild records, wills, census listings and the Bills of Mortality have been used as a basis for creating family reconstitution and other data. The focus in this paper has been on samples of individual families from a variety of different parishes and districts in London. Given the nature of the data, the conclusions reached are necessarily provisional. However, we have attempted to construct a picture of mortality change over this long period, in the belief that this creates fruitful hypotheses about long-term patterns of mortality. Only minimal interpretation of suggested trends has been carried out, mainly because of the absence of studies of disease patterns during the period covered.

An analysis of the relationship between wealth/poverty and mortality has been included. Virtually all writers on the

---

Journal of Interdisciplinary History, Volume 6, 1975; P.R. Galloway, 'Annual variations in deaths by cause, prices and weather in London 1670-1830', *Population Studies*, Volume 39, 1986.

[521] W. Heberden, *Observations on the Increase and Decrease of Different Diseases*, 1801; W. Ogle, 'An Inquiry into the trustworthiness of the old Bills of Mortality', *Journal of the Statistical Society*, Volume 55, 1892; A. Hardy, 'Diagnosis, death and diet: the case of London, 1750-1909', *Journal of Interdisciplinary History*, Volume 18, 1988.

[522] For this type of individually based research see Finlay, *Population and Metropolis*; J. Landers, *Death and the Metropolis: Studies in the Demographic History of London*, 1993.

subject – including Chadwick, Marx, Engels and Mayhew[523] – have assumed that poverty was strongly associated with ill-health and high mortality, and yet we have found in our research that this was not the case in London before the mid-nineteenth century. For example, as we will see later, the healthiest areas with the lowest mortality in 1838-44 were not the wealthy districts of the West End, but the poor areas of the East End of London. We will argue in this paper that mortality was not primarily shaped by wealth and poverty, but mainly by exogenous disease patterns largely independent of economic factors.[524]

Likewise it has been widely assumed that London until the nineteenth century was a 'mortality sink', sucking in England's surplus population because of its inordinately high mortality.[525] One of the main findings of the paper is that in the period between 1550 and 1650, London's infant and child mortality was relatively low, and that this helped generate the rapid population growth of the city during this period.

Additional work will be required to evaluate these radical conclusions, but we hope the paper will stimulate further research on London's population history in the belief that this will significantly illuminate the history of the city over a three hundred year period.

---

[523] E. Chadwick, *The Sanitary Conditions of the Labouring Population*, 1842. For Marx's and Engels' views on the relationship between poverty and health see F. Engels, *The Condition of the Working Class in England*, 1845; for Mayhew's discussion of the effects of poverty see H. Mayhew, *The Morning Chronicle Survey of Labour and the Poor: the Metropolitan Districts,* 6 Volumes, 1980.

[524] For a discussion of these issues see P. Razzell, C. Spence, 'Poverty or disease environment? The history of mortality in Britain, 1500-1950', in M. Breschi and L. Pozzi (eds.), *The Determinants of Infant and Child Mortality in Past European Populations,* 2004; P. Razzell, C. Spence, The hazards of wealth; the history of adult mortality in pre-twentieth century England', *Social History of Medicine,* Volume 19, 2006.

[525] See Harding, 'Early modern London, 1550-1700', p. 36.

Infant and Child Mortality

Evidence on infant and child mortality is available in the London Bills of Mortality for the period from 1728 onwards, and is summarized as follows:

Table 1: Infant and Child Mortality from the London Bills of Mortality, 1728-1829.[526]

Period	Number of Baptisms	Burials Under 2 as a % of the Number of Baptisms	Burials Aged 2-5 as a % of the Number of Baptisms	Burials Under 5 as a % of the Number of Baptisms
1728-29	33712	61.1%	14.6%	75.7%
1730-39	170196	59.8%	13.7%	73.5%
1740-49	145260	60.8%	14.9%	75.7%
1750-59	147792	50.8%	12.7%	63.5%
1760-69	159603	49.4%	13.2%	62.5%
1770-79	173178	44.6%	12.1%	56.7%
1780-89	176299	36.1%	10.3%	46.4%
1790-99	187345	33.0%	11.1%	44.1%
1800-09	199443	27.8%	10.9%	38.6%
1810-19	221334	24.4%	8.7%	33.1%
1820-29	256576	22.6%	8.0%	30.6%

Table 1 indicates that infant and child mortality was more or less constant between 1728 and 1749, but fell steadily and progressively from 1750 to 1829. There has, however, been controversy about the reliability of the Bills of Mortality and there is no consensus about the quality of either birth or death registration.[527]

---

[526] Source: J. Marshall, *The Mortality of the Metropolis*, 1832.

[527] The uncertain quality of the Bills of Mortality has led scholars to adopt significantly different correction ratios for inflating baptism and burials into estimated births and deaths. For two very different estimates of mortality based on the Bills of Mortality see J. Landers, 'Mortality and metropolis: the case of London 1675-1825', *Population Studies*, Volume 41, 1987, p. 63; R.

Attempts have been made to address this problem by applying family reconstitution techniques to parish register and other data. Finlay has analysed a number of London parish registers for the period 1580-1650,[528] and Landers and Vann & Eversley have used London Quaker records for reconstitution research.[529] None of these studies has been able to completely resolve the problem of burial register reliability. Finlay found very low rates of infant mortality for most of the parishes studied — in one case as low as 55 per 1,000[530] — and assumed that much of this was due to burial under registration. The findings of the separate studies carried out by Landers and Vann & Eversley on Quaker infant mortality were contradictory,[531] and this may have been because of the different nature of the samples involving variations in data quality.

We have conducted reconstitution research on a number of parishes in the City of London, linked to the published and indexed London 1695 Marriage Duty Act Listing, which provides not only details of living family members, but also levels of taxable wealth.[532] The creation of reconstitution data was facilitated by the genealogical work of Percival Boyd, who in the late 1930s and 1940s compiled 238 volumes of family histories for London inhabitants, covering a

---

Woods, 'Mortality in eighteenth century London: a new look at the Bills', *Local Population Studies*, Number 77, 2006.

[528] Finlay, *Population and Metropolis.*

[529] Landers, *Death and the Metropolis*; R.T. Vann, D. Eversley, *Friends in Life and Death: the British and Irish Quakers in the Demographic Transition*, 1972.

[530] R.A.P. Finlay, 'The accuracy of the London parish registers, 1580-1653', *Population Studies*, Volume 32, 1978, p. 99.

[531] See J. Landers, 'Mortality in eighteenth century London: a note', *Continuity and Change*, Volume 11, 1996.

[532] See D.V. Glass (ed.), *London Inhabitants within the Walls*, 1965.

total of 59,389 family groups.[533] Boyd used parish registers, guild records, marriage licences, wills and a whole miscellany of sources, to create individual family histories mainly for the sixteenth, seventeenth and eighteenth centuries, enabling the tracking of children from baptism through to the date of last independent observation of the family.

The individual family sheets are not in standard format but usually include information on names of parents and children, as well as date of baptism and burial of children. Boyd sometimes estimated the year of birth of a child from wills and other documentary sources, and the lack of standardization means that his family histories have to be treated with some care. However, as we are concerned here with mortality and not fertility, it is the quality of burial registration which is most important. Given the uncertain quality of burial register data, it is important to evaluate its reliability before embarking on detailed research on mortality.

There was a custom in England of giving the name of a dead child to a subsequent child of the same sex. Evidence from local censuses and other listings suggests that there were a minimal number of living children with the same name in individual families in the period up to the middle of the seventeenth century, and none after that period.[534] Where two children of the same family were baptized with an identical name, it is therefore possible to measure the completeness of burial registration by searching for the first same-name child

[533] This material is deposited in the library of the Society of Genealogists. For details of this source see A. Camp, 'Boyd's London burials and citizens of London', *Family Tree*, Volume 1, 1985, p. 12; J. Beach Whitmore, 'London citizens', *Genealogists Magazine*, 1944.

[534] We have examined the 1695 census listing of the city of London carried out under the Marriage Duty Act, and have been unable to find any living same-name children in any of the families enumerated. See D.V. Glass (ed.), *London Inhabitants Within the Walls*, 1965. For an examination of other census and a discussion of the same-name method see P. Razzell, 'Evaluating the same-name technique as a way of measuring burial register reliability' *Local Population Studies*, Number 64, 2008.

in the burial register. (It is the first of a pair of children with identical names that is designated as a same-name child.) The technique can only be applied to families with at least two recorded baptisms of children of the same sex, but it is a valuable method of assessing the quality of burial registration.

This can be illustrated by the example of one family listed by Boyd and traced in the 1695 Marriage Duty Listing (see Table 2).

Table 2: The Family of Samuel and Sarah Fowler, Tyler and Bricklayer, of St. Antholin's, London.[535]

Name of Child	Date of Baptism	Date of Burial
Thomas	05/07/1677	04/01/1721
Samuel	**04/05/1679**	**29/04/1681**
William	08/01/1683	03/06/1708
Samuel	10/05/1685	15/02/1688
John	**07/08/1687**	**--**
John	**12/05/1689**	**09/10/1692**
Sarah	22/04/1691	06/02/1748
Mary	18/07/1693	12/11/1694
John	21/11/1695	--

Of the three same-name cases, highlighted in bold, two of them were traced in the burial register. The second same-name case John baptised on the 7th August 1687 was found neither in the burial register nor in the 1695 Marriage Duty Listing, indicating that he probably died without being registered. (The last John was baptised in late 1695 and

[535] Source: 1695 Marriage Duty Listing: Samuel Fowler, wife Sarah, son James, son Thomas, son William, daughter Sarah. Of St. Antholin's Parish.

therefore did not appear in the Marriage Duty Listing made before that date.)

The same-name method allows for the correction of burial under-registration by multiplying the number of recorded burials by the total number of same-name cases and dividing by the number of same-name cases found in the burial register. In the case of the Fowler family, the correction ratio is 3/2. This inflation ratio corrects both for non-registration due to omission from the burial register, as well as burial in neighbouring parishes and elsewhere, accounting for all forms of under-registration.

A sample was constructed from the Boyd volumes by selecting, in sequence, families from the first eight parishes in volumes 1-28, and this sample has been used in all tables analysing Boyd family listings. The eight parishes included in the sample were: St. Christopher le Stocks, St. Edmund Lombard Street, St. Martin Outwich, St. Antholin, St. John Baptist, All Hallows Bread Street, St. John Evangelist, and St. Mary Woolnoth. These eight parishes are not necessarily representative of over 100 parishes that existed in the City of London, although independent evidence to be considered later suggests that mortality levels in the eight parishes were probably fairly typical of London as a whole.

We can compare the burial registration experiences of wealth holders with those not owning the form of wealth eligible for extra taxation indicated in the 1695 Marriage Duty Act returns.[536] Of 64 same-name children from wealth-holding families included in Boyd's sample and traced in the Marriage Duty Listings, 18 (28 per cent) could not be found in the burial register, compared to 30 of 81 (37 per cent) from non-wealth holding families.

Of 37 eligible same-name children [537] not found in the burial register, none could be found in the Marriage Duty

[536] The main form of wealth listed was the ownership of real estate worth £600 or more, although other categories of wealth-owners were also included.
[537] These 37 same-name children were those born before 1695.

Listing, providing some support for the assumption that a missing same-name case is equivalent to an unregistered burial. Overall, 33 per cent of same-name cases could not be traced in the burial register, suggesting that about a third of all infant and child deaths were not registered. Applying the overall same-name correction ratio to all baptisms and infant burials in the sample generates a corrected infant mortality rate of 334 per 1,000 for the period 1681-1709. John Landers has independently estimated that infant mortality in London at the end of the seventeenth century was at least 360 per 1,000.[538] Given that mortality before baptism is excluded from the figure of 334 per 1,000, it is very similar to that estimated by Landers.

Child mortality can be calculated by establishing the children at risk — children surviving the first year and remaining in independent observation (through a recorded event of another family member in the Boyd and marriage duty records) until their fifth year — and dividing the number of corrected child burials (burials multiplied by the same-name ratio) by the number of children at risk. We can estimate infant and child mortality rates amongst those listed as owning and not owning taxable wealth in the Marriage Duty Act listing as summarised in Tables 3 and 4.[539]

---

[538] Personal communication from John Landers. According to the London Bills of Mortality child burials under the age of two represented about 60 per cent of baptisms in the period 1728-1739, suggesting that the same-name ratios in Table 2 do not overstate the levels of under-registration of burials. See Marshall, *Mortality*, p. 63.

[539] Boyd's data probably includes more wealth-holders than was typical for London as a whole. Glass estimated that about 27 per cent of the population were wealth-holders paying the higher level of taxation, lower than the proportion of wealth-holders in Table 3 and 4.

Table 3: Corrected Infant Mortality Rates (per 1000) among London Wealth and Non-Wealth Holders, 1681-1709.[540]

Wealth Holders				Non-Wealth holders			
Number Baptisms	Number Infant Burials	Same Name Ratio	IMR	Number Baptisms	Number Infant Burials	Same Name Ratio	IMR
611	131	61/46	284	642	155	81/51	383

Table 4: Corrected Child (1-4) Mortality Rates (per 1000) among London Wealth and Non-Wealth Holders, 1681-1709.[541]

Wealth Holders				Non-wealth holders			
Number Children (1-4) at Risk	Number Child Burials	Same Name Ratio	CMR	Number Children (1-4) at Risk	Number Child Burials	Same Name Ratio	CMR
448	62	61/46	184	424	62	81/51	232

Both infant and child mortality were highest among non-wealth holders, although these forms of mortality were still high amongst wealthy families, with nearly half of their children dying under the age of five.

It is possible to extend research on the Boyd data both backward and forward in time. Tables 5 and 6 contrast data for the total sample with that for members of the 12 great livery companies, designated as elite families.[542]

[540] Source. *Boyd's London Inhabitants*.
[541] Source. *Boyd's London Inhabitants*; Glass, *London Inhabitants.*
[542] B. Weinreb, C. Hibbert, *The London Encyclopedia*, 1993, pp. 167-77.

Table 5: Infant Mortality (per 1000) in the City of London, 1539-1849.[543]

Total Sample			Elite Families	
Period	Number Baptisms	IMR	Number Baptisms	IMR
1539-99	839	155	485	121
1600-49	1073	238	610	222
1650-99	1020	256	465	261
1700-49	704	409	194	422
1750-99	720	263	-	-
1800-49	199	141	-	-

Table 6: Child (1-4) Mortality (per 1000) in the City of London, 1539-1849.[544]

Total Sample			Elite Families	
Period	Number Children At Risk	CMR	Number Children At Risk	CMR
1539-99	616	168	404	134
1600-49	770	224	485	190
1650-99	686	282	340	291
1700-49	387	176	131	240
1750-99	435	270	-	-
1800-49	102	118	-	-

After 1750 there is insufficient information on elite families for a breakdown of these data. The proportion of same-name cases untraced in the burial register for the whole period

[543] Source: Boyd's *London Inhabitants*; Glass, *London Inhabitants.* Full details of Tables 5 and 6 are to be found in P. Razzell, *Population and Disease: Transforming English Society. 1550-1950*, 2007, p. 134.
[544] Source: Ibid.

1539-1849 is identical in both the total and elite samples – 112/320 and 51/146 – 35 percent. The proportion of untraced cases for the complete sample over time was as follows: 1539-1599: 17/48 (35 per cent); 1600-1649: 31/83 (37 per cent); 1650-1699: 32/99 (32 per cent); 1700-1749: 29/68 (43 per cent); 1750-1849: 6/22 (27 per cent). The numbers are too small to analyse differences between elite families and the total sample, or variations over time in the period 1750-1849.

Mortality was lower amongst the elite group than in the total sample population during the period 1539-1649, but this differential was reversed in the period 1650-1749 when mortality was higher among wealthier families. However, the most striking feature of Tables 5 and 6 is the very significant increase in infant and child mortality between the periods 1539-1599 and 1700-1749 in both groups. Infant mortality increased by about two-and-a-half times in the total sample, and more than tripled among elite families during this period. Child mortality approximately doubled in both groups between the sixteenth and the middle of the eighteenth century. There was also a marked drop in infant mortality among the total sample after the middle of the eighteenth century, similar to that depicted in the Bills of Mortality, although child mortality fluctuated during the eighteenth century before falling sharply in the early nineteenth.

The low infant mortality rate in the sixteenth and early seventeenth century is confirmed by Finlay's research on four parishes: the uncorrected rate for this period was as follows: All Hallows Bread Street, 1538-1653: 83/1,000; St Peter Cornhill, 1580-1650: 107/1,000; St Christopher le Stocks, 1580-1650: 55/1,000; St Michael Cornhill, 1580-1650: 109/1,000.[545] The equivalent uncorrected rate for the total Boyd sample for 1539-1649 is 131/1,000, indicating that the latter is not an understatement of London's infant mortality in this period.

[545] Finlay, *Population and Metropolis*.

Given the unexpected finding of a marked increase in infant and child mortality from the sixteenth to the middle of the eighteenth century, a special reconstitution study was carried out for the parish of St Bartholomew's for the period 1618-1849 (Table 7).

Table 7: Infant and Child Mortality (per 1000) in St. Bartholomew's the Less, London, 1618-1849.[546]

Period	Number of Infant Baptisms	Number of Children (1-4) at Risk	IMR	CMR
1618-49	328	143	191	282
1650-99	592	224	260	254
1700-49	564	202	342	278
1750-99	371	148	129	91

There was no overall change in child mortality between 1618 and 1749, but a sharp increase in infant mortality – from 191/1,000 to 342/1,000 – confirming at least in part the findings from the analysis of the Boyd data. There were also marked falls in infant and child mortality after 1750, similar to those found in Tables 1, 5 and 6. However, the proportion of infants traced through to the age of five was significantly less in the St. Bartholomew's than in the Boyd sample, and this is probably because the latter included a large proportion of permanent householders.

There is also the problem of increasing birth-baptism intervals which occurred in the eighteenth and early nineteenth century. The St. Bartholomew's the Less baptism register contains information on dates of birth and baptism for the period 1650-1812

[546] The figures are derived from the St. Bartholomew's parish register in the Society of Genealogists' Library. Full details of Tables 5 and 6 are to be found in the article published in *The London Journal*, Volume 32, 2007.

Table 8: Birth-Baptism Intervals in St. Bartholomew's the Less, 1650-1812.[547]

Period	Proportion Under Two Weeks	Proportion Above Two and Below Six Weeks	Proportion Above Six Weeks	Number Information on Birth-Baptism Intervals
1650-99	89%	10%	1%	583
1700-49	57%	43%	1%	753
1750-99	22%	70%	8%	457
1800-12	1%	65%	34%	71

The proportion of infants baptised within two weeks of birth fell steadily throughout the eighteenth century. This creates a problem of measuring neonatal mortality as many infants would have died before baptism without being registered in the burial register (under canon law unbaptized children were not members of the Anglican Church and were therefore not formally allowed to be buried by it). This is a form of burial under-registration which cannot be measured by the same-name method. However, it has been estimated that nationally approximately five per cent of infants died before baptism in the period 1838-1844,[548] which in London would represent about a third of all infants dying in the first year. Some clergymen baptised infants known to be at risk of dying, and so perhaps the lower proportion is a more accurate representation of unregistered infants. Table 8 indicates that the measurement of infant mortality using baptism and burial registers becomes progressively more difficult towards the end

[547] Full details of the Table are to be found in the article published in *The London Journal*, Volume 32, 2007.
[548] P. Razzell, *Essays in English Population History*, 1994, p. 147.

of the eighteenth and the beginning of the nineteenth century because of the increasing interval between birth and baptism.

It is possible to analyse infant and child mortality in St. Bartholomew's by socio-economic status. The parish register designates elite status by describing fathers as 'esquire', 'gentlemen' or 'Mr',[549] and the following table compares the mortality of this elite group with that of the non-elite population.

Table 9: Infant and Child (1-4) Mortality in St. Bartholomew's the Less by Socio-Economic Status, 1619-1848.[550]

	Elite Group		Non-Elite Population	
	1619-1749	1750-1848	1619-1749	1750-1848
Number of Infant Baptisms	371	119	1152	256
Number of Children (1-4) at Risk	200	48	384	101
IMR	307	160	260	93
CMR	300	83	277	91

[549] Full details of the Table are to be found in the article published in *The London Journal*, Volume 32, 2007. Additional research confirms the elite status of fathers given the titles of esquire, gentlemen or Mr. In the two periods 1655-70 and 1751-1812, information is given on whether people were buried inside or outside the church: 75 of 92 (83 per cent) members of elite families were buried inside the church, compared to 4 of 29 (14 per cent) of servants. Of 55 people buried inside the church and located in the 1695 Marriage Duty listing, 33 (65 per cent) were in families with £600+ fixed wealth or £50 p.a., whereas none of the 26 people buried outside and traced in the 1695 Listing were in the higher wealth category.

[550] For the source of this data see the St. Bartholomew's Parish register in the Society of Genealogists' Library.

The sample sizes are small for the post-1750 period, but the figures in Table 9 indicate that infant mortality was slightly higher in the elite than the non-elite group in both 1619-1750 and 1750-1848, and child mortality was higher in 1619-1749. This is similar to the finding on socio-economic status and mortality in Tables 5 and 6 for the period 1650-1749, but different from the conclusions in Tables 3 and 4 for 1681-1709. However, the periods and nature of the samples are different in each of the separate studies, and the mortality differences between wealthy/elite and other families are not greatly significant in any of the samples covered by the above tables.

These findings on infant and child mortality are very similar to those of John Landers on London Quakers for the period 1650-1849. The Quakers were a relatively prosperous group and perhaps occupied an intermediate socio-economic position between the wealthy and non-wealthy groups analysed in the present article. Table 10 only covers the period 1650-1849, but the overall level and pattern of mortality change is similar to that discussed earlier in this paper

Table 10: Age-Specific Mortality Rates per Thousand among London Quakers, 1650-1849.[551]

	Age (Years)		
Cohort	0-1	1-2	2-4
1650-74	251	103	190
1675-99	263	113	132
1700-24	342	145	177
1725-49	341	143	186
1750-74	327	150	159
1775-99	231	101	141
1800-24	194	93	85
1825-49	151	77	93

[551] Source: J. Landers, 'London's mortality in the long eighteenth: family reconstitution Study', *Medical History*, Supplement No. 11, 1991, p.7.

Mortality under the age of two increased up to the middle of the eighteenth century, and fell in the last half of the eighteenth and first half of the nineteenth century, while later child mortality decreased mainly in the first half of the nineteenth century. Landers' study mainly covers the area south of the river, and the evidence discussed in this article has focused on the City of London. However, both appear to have been fairly representative of London in the eighteenth and first half of the nineteenth century. There was relatively little variation in infant and child mortality between different districts in London at the beginning of civil registration, even between those with different socio-economic characteristics.

The Registrar General published details of the mean rateable value of housing in all registration districts, allowing an analysis of the relationship between poverty and mortality at the district level. Table 11 summarises mortality by district, arranged by level of mean rateable value, in the period immediately after the introduction of civil registration.

Table 11: Infant, Child (1-4) and Adult (25-44) Mortality in London, 1838-44.[552]

Registration District	Mean Annual Value of House Property (£)	IMR	CMR	Adult Mortality
Bethnal Green	8.1	159	54	11
Camberwell	12.3	141	34	14
Shoreditch	13.4	149	55	14
Bermondsey	13.5	140	59	11
Newington	14.1	160	47	10
Stepney	14.8	159	50	12
St. George,	15.4	182	63	13

[552] Source: Register General, *5th Annual Report,* 1843, p. 446; Register General, *8th Annual Report,* 1848, pp. 192-93; Register General, *9th Annual Report, Folio Edition,* 1848, pp. 236-38.

Southwark				
Greenwich	15.8	149	46	20
Rotherhithe	19.9	146	59	15
Lambeth	21.5	149	51	10
Mean Average of 10 Above Districts	14.9	153	52	13
Hackney	22.4	144	33	11
Whitechapel	22.4	194	75	20
St. George in the East	23.6	168	66	14
Islington	24.9	148	38	10
East & West London	25.3	186	82	21
Clerkenwell	25.4	155	47	11
St. Saviour & St. Olave	27.1	188	76	35
St. Luke	27.9	132	64	10
Kensington & Chelsea	29.1	163	47	12
Holborn	29.7	200	65	10
Mean Average of 10 Above Districts	*25.8*	168	59	15
Poplar	31.7	134	42	15
Westminster	32.4	180	65	17
Pancras	33.1	166	52	15
St. Giles	47.8	188	38	12
Strand	48.8	173	67	11
Marylebone	57.5	167	60	14
St. James Westminster	69	169	68	10
City of London	77.5	151	61	11
St. George Hanover Square	79.2	166	52	16
St.Martin's in the Fields	101.8	177	73	15
Mean Average of 10 Above Districts	57.9	167	58	14

The ten districts with the lowest rateable values – mainly in the East End of London – had the lowest infant and child mortality rates. In interpreting these findings, there is the problem of institutional mortality where deaths in hospitals and workhouses sometimes occurred outside the district of birth.[553] There appears to have been greater fluctuations in adult rather than infant or child mortality in the period 1838-44, although Farr made mathematical adjustments to allow for institutional mortality in this period.[554]

Robert Woods found a link between poverty and infant mortality in London during the 1880s,[555] using Booth's estimates of poverty by district. The poor districts at this time were more or less the same as those in the 1840s – most being in the East End of London – so it is possible that the social class gradient in infant mortality only began to establish itself in London during the latter part of the nineteenth century. However, the evidence in this paper indicates little or no association between poverty and infant/child mortality in the period 1550-1850, suggesting that disease played a largely exogenous role in shaping London's mortality patterns. This is an important and unexpected finding which will be discussed later in the paper.

Adult Mortality

Adult mortality is difficult to measure through reconstitution research because only a small proportion – usually about 10 per cent – can be traced from birth to the date of adult death. There are also formidable difficulties in establishing correct

[553] B. Luckin, G. Mooney, 'Urban history and historical epidemiology: the case of London, 1860-1920', *Urban History*, Volume 24, 1997, p. 47.
[554] Ibid.
[555] R. Woods, 'Mortality, poverty and environment' in R. Woods, J. Woodward (eds.), *Urban Disease and Mortality*, 1984, p. 24.

individual identity in baptism and burial registers. Special techniques are required to assess adult mortality levels, and there are two main sources available for this purpose in London during the period 1580-1849, marriage licences and apprenticeship records. According to an analysis of a sample of 14 London parish registers, 65 per cent of marriages were by licence in the first half of the seventeenth century, a proportion which had increased to 91 per cent by 1651-1750, before declining to 31 per cent at the beginning of the nineteenth century.[556] For women marrying under the age of twenty-one, parental consent was required, usually by written affidavit. The majority of marriage licence allegations have survived for London, and they usually contain the following relevant information: 1. Whether father alive or dead at date of marriage. 2. If father alive, his name and place of residence. 3. If father dead, name of mother or where relevant, guardian.

Because of uncertainty about father's place of residence – many young women who were married in London were migrants from the country – it is difficult to carry out an exact analysis of London's paternal mortality. Also, there is no reliable information on fathers' ages, although this is likely to be strongly influenced by age at marriage. The limited amount of evidence available indicates that there were no long- term changes in the mean age of male marriage during the seventeenth, eighteenth and early nineteenth centuries, suggesting that fathers' ages did not change significantly during this period.[557]

---

[556] P. Razzell, 'The conundrum of eighteenth century English population growth', *Social History of Medicine*, Volume 11, 1998, p. 484.

[557] According to marriage licence data, the mean age of marriage of London bachelors was 27.6 in 1630-36 and 27.2 in 1693-95. The figures for 1630-36 are based on the first 200 marriages selected from the Bishop of London marriage licences. See G.J. Armytage (ed.), *Allegations for Marriage Licences Issued by the Bishop of London 1611-1828,* Volume 26, 1887 The figures for 1693-95 are derived from the first 200 marriages selected from the Vicar Generals' marriage allegations in the Society of Genealogists' library. The

Table 12: Spinsters Marrying Under 21: Fathers Listed as Dead, London Marriage Licences.[558]

Period	Total Number of Cases	Number of Fathers Dead	Proportion of Fathers Dead
1600-41	696	303	44%
1661-99	1950	901	46%
1700-49	2500	1171	47%
1750-89	1937	694	36%
1840-49	500	143	29%

Table 12 indicates a slight rise in paternal mortality between 1600-1641 and 1700-1749, although there were fluctuations of mortality in this period, such as a rise to 55 per cent in the 1660s. This rise was probably partly due to the effect of the plague, although Table 10 includes data on fathers living and dying outside of London, who were presumably less vulnerable to plague mortality.

Overall paternal mortality was high and relatively stable during the period 1600-1749, but declined significantly and steadily from the middle of the eighteenth century onwards, falling from 47 per cent in 1700-49 to 29 per cent in 1840-49. The chronology of the fall in paternal mortality is similar to that found for infant and child mortality, although

mean age of marriage of bachelors in England & Wales in 1867-82 was 25.8 years, but the London average was probably higher than this in the early nineteenth century. 4.3 per cent of bachelors married under 21 nationally, compared to 1.6 per cent in the metropolis in 1843-44. See the Register General, *7th Annual Report,* 1843-44, pp xxx, xxxi; Registrar General, *45th Annual Report,* 1882, p. viii.

[558] For the period 1600-41, the data are based on the analysis of the Bishop of London's marriage licences in Armytage, *Allegations.* For the periods after 1661, the figures are based on an analysis of cases selected in sequence from the start of the dates of the Vicar-General's marriage licence allegations deposited in the Society of Genealogists' Library.

the latter more than halved between 1725-1749 and 1825-1849, whereas paternal mortality declined by about 38 per cent.

The long-term trend in paternal mortality is confirmed by independent evidence from apprenticeship records, although there is some uncertainty about the quality of data because of the potential problem of self-selection.[559]

The high paternal mortality in London at the beginning of the eighteenth century is confirmed by data from the national apprenticeship register compiled for taxation purposes. Of 373 cases listed in London and Middlesex for the period 1710-1713, 37 per cent of fathers were dead at the date of the indenture of their son, significantly higher than the percentage found in the same period for the northern rural counties of Northumberland, Rutland, Westmoreland and Yorkshire – 27 per cent (91 of 336 cases) – and in Scotland – 22 per cent (33 of 151 cases).[560]

An analysis of the socio-economic status of fathers and levels of paternal mortality indicates that mortality was higher amongst wealthy fathers. This was true both nationally and also in London, the latter indicated in Table 13.

Table 13: Mortality Among London Fathers Listed in the British Apprenticeship Register, 1710-13, by Amount of Premium Paid.[561]

Premium Paid	Number of Cases	Proportion of Fathers Dead
£9 And Under	110	32%
£10-£19	93	41%
£20+	99	42%

Fathers paying the higher premiums were gentlemen, merchants and others with high socio-economic status occupations, whereas those paying lower premiums were

[559] It is possible that poor widows had no incentive to place their sons into apprenticeships, although there is no direct evidence on this and any possible distortions are unlikely to have varied greatly over time.

[560] The data are based on the analysis of the British apprenticeship register lodged in the Society of Genealogists' Library.

[561] Ibid.

labourers, porters and others with manual occupations.[562] Higher paternal mortality in wealthier groups is an unexpected finding, although the sample sizes are small and there are data to indicate that boys from different socio-economic groups were apprenticed at slightly different ages, affecting the period in which fathers were at risk of dying.[563]

However, there is evidence that fathers' ages were probably very similar between the different occupational groups.[564] Larger samples are required before confident conclusions can be reached about the relationship between premium levels and paternal mortality.

A review of actuarial evidence from insurance companies and friendly societies found that adult mortality was higher amongst middle class than working class groups in the first half of the nineteenth century, a finding that was confirmed for some occupational groups by early census and civil registration data.[565] It is possible that the families of socio-economic elites were more vulnerable to infection through geographical mobility and contact with a greater number of disease environments, e.g. merchants travelling and trading with foreign countries. Additionally, elite families probably escaped some childhood diseases – such as smallpox – through avoidance practices, which made them vulnerable to the diseases as adults. There is also evidence that life-style factors – the excessive consumption of food, alcohol and tobacco, accompanied by the lack of physical activity – damaged the health of the wealthy, both in London and elsewhere.[566]

---

[562] See Razzell and Spence, 'Poverty', p. 63.

[563] Samples taken from the national apprenticeship register for the period of 1710-13 indicate that the average ages of apprentices in the different premium categories were as follows: £1-5: 14.4 years; £6-14: 14.9 years: £15+: 15.9 years. See Razzell and Spence, 'Poverty', p. 63. These figures are based on an analysis of Vicar General's marriage allegations in the Society of Genealogists' Library.

[564] The mean age at marriage in London does not appear to have varied greatly by social status at this time. In 1687, the mean age of marriage of London bachelors according to marriage licences was as follows: merchants, gentlemen and professionals: 26.8 years (N = 200); tradesmen and artisans: 26.4 (N = 360); mariners, servants and labourers (1687-94): 27.5 (N = 135).

[565] Razzell and Spence, 'The hazards of wealth', pp. 59, 60. See also Table 9.

[566] Ibid.

The Impact of Mortality on London's Population

Table 14 summarises estimates of London's population during the period 1520-1851, estimates which are very approximate because of the uncertain reliability of the source material.[567]

[567] Finlay and Shearer have put forward a set of alternative population figures, but these are partly based on inflation ratios applied to parish register data. These ratios are significantly different from those used in the present paper, highlighting the uncertain nature of all population estimates before the advent of national census registration in 1801. See R. Finlay, B. Shearer, 'Population growth and suburban expansion', in A.L Beier, R. Finlay (eds.), *London 1500-1700: The Making of the Metropolis*, 1986. The figures for London are taken from E.A. Wrigley, 'A simple model of London's importance in changing English society and economy 1650-1750', *Past and Present,* Volume 7, 1967, p. 44; E.A. Wrigley, *People, Cities and Wealth*, 1987, p. 162. For Greater London, see B.R. Mitchell, P. Deane, *Abstract of British Historical Statistics*, 1971, p. 19. Estimates of England's population for 1600-1801 are based on Rickman's returns of national baptisms, assuming a constant baptism rate. See Mitchell and Deane, *Abstract*, p. 5; E.A. Wrigley, R.S. Schofield, *The Population History of England, 1541-1871*, 1981,

Table 14: Estimated Population Size of London, 1520-1851.[568]

Date	Estimated Population of London	Period	Annual % Increase	Estimated Population of England	London's population as a % of England's Population
1520	55000			2600000	2.1%
1600	200000	1520-1600	3.3%	4300,000	4.7%
1650	400000	1600 1650	2.0%	5250000	7.6%
1700	575000	1650-1700	0.9%	5100000	11.3%
1750	675000	1700-1750	0.3%	6000000	11.2%
1801	960000	1750-1801	0.8%	8600000	11.2%
	Greater London			England & Wales	
1801	1117000			8900000	12.6%
1851	2685000	1801-1851	2.8%	17900000	15.0%

The inverted U-pattern of growth – rapid during the sixteenth and the first half of the seventeenth century, slowing during 1650-1750, and beginning to grow more rapidly after 1750 – is similar to the pattern of infant and child mortality depicted in Tables 5 and 6. This suggests that for the period before 1650,

[568] The figures for London are taken from Wrigley, 'A simple model', p. 44; E.A. Wrigley, *People, Cities and Wealth*, 1987, p. 162. For Greater London, see Mitchell and Deane, *Abstract*, p. 19. Estimates of England's population for 1600-1801 are based on Rickman's returns of national baptisms, assuming a constant baptism rate. See Mitchell and Deane, *Abstract*, p. 5; Wrigley and Schofield, *The Population*, p. 574. The estimate of English 1520 population is derived from Wrigley and Schofield, *The Population*, p. 575.

mortality did not prevent rapid population growth as it did after the middle of the seventeenth century.[569]

The exact role of mortality in shaping London's population is complex, as there are a number of other factors, including fertility and migration, which were important for population growth. Before the widespread practice of birth control in the second half of the nineteenth century, fertility was largely shaped by patterns of nuptiality, particularly age at marriage. Although full and accurate information on marriage age in London is not available for the whole period 1550-1850, marriage licences do indicate the numbers of women marrying under the age of 21 due to the legal requirement of parental consent.

According to figures in Table 15, nearly half of single women living in London were married under the age of 21 in the early seventeenth century, and this was one of the factors associated with rapid population growth during the period.

[569] For a discussion of the role of mortality in shaping population growth in the period 1650-1750 see E.A. Wrigley, 'A simple model'.

Table 15: Proportion of Single Women Resident in London Marrying Under the Age of Twenty-One, Marriage Licences, 1600-1849.[570]

Period	Number of Single Women Marrying Under 21	Total Number of Marriages of Single Women	Proportion of Single Women Marrying Under 21
1600-39	188	400	47.0%
1661-99	162	400	40.5%
1700-49	138	500	27.6%
1750-99	50	500	10.0%
1800-49	28	500	5.6%

The proportion of women marrying under 21 fell significantly during the eighteenth and early nineteenth centuries, and this may have been partly the result of the reduction in adult mortality, which allowed women to achieve desired fertility at a later age of marriage. The decline in early marriage probably contributed to the slowing of population growth, although in the long run it did not prevent a resumption of a very rapid increase in London's population during the first half of the

[570] Source: The first hundred consecutive marriages were selected at the beginning of each decade for the periods covered by Table 16. For 1600-39, the marriages were taken from Armytage, *Allegations*. For all subsequent periods, the marriages were selected from the copies of the Vicar General's marriage allegations in the Society of Genealogists' Library. The early age of marriage at the beginning of the seventeenth century is confirmed by V.B. Elliott, 'Single women in the London marriage market: age, status and mobility, 1598-1619', in R.B. Outhwaite (ed.), *Marriage and Society: Studies in the Social History of Marriage,* 1981. The proportion of single women marrying in London during the first half of the nineteenth century is similar to that found by the Registrar General in 1843-44: 7.7%. See the Registrar General, *Seventh Annual Report,* 1843-44, 1846, pp. xxx, xxxi.

nineteenth century, which was largely the result of the reduction in mortality.

Table 14 indicates that population increased much more rapidly in London than it did in the rest of England and Wales. It grew from 2.1 per cent of the national total in 1520 to 15.0 per cent in 1851, and some of this growth was fuelled by migration. Table 16 summarises data on the geographical origin of plumbers' and masons' apprentices.

Table 16: Geographical Residence of Fathers of Plumbers' and Masons' Apprentices Indentured, 1570-1799.[571]

Period	Number of Plumbers' Apprentices	Proportion of Fathers Residing Outside London	Number of Masons' Apprentices	Proportion of Fathers Residing Outside London
1570-99	21	86%	--	
1600-49	67	85%	--	
1650-99	140	71%	994	68%
1700-49	129	57%	884	37%
1750-99	56	39%	347	32%

Migration patterns revealed by Table 16 are confirmed by additional evidence based on apprenticeship records,[572] although

[571] For the source material on which these figures are based see C. Webb (ed.), *London Apprentices, Volume 33: Plumbers' Company, 1571-1800*, 2000; C. Webb (ed.), *London Apprentices, Volume 27: Masons' Company, 1663-1805*, 1999. The figures for plumbers in the 1650-99 category are based on the period 1663-99.

[572] For confirmation of the very high proportion of migrants in the early seventeenth century, see Elliott, 'Single women', p. 84. An analysis of the records of the apprentices who acquired the freedom of the City of London indicates that the proportion of fathers living outside London fell from 77 per cent in 1673-74 (N = 200) to 14 per cent in 1822-24 (N = 99). See 'City of London Freedom Certificates' Guildhall Library, Corporation Record Office, reference CF1.

data derived from marriage licences suggest a lower level of in-migration in the early seventeenth century. Bishop of London licences indicate that 61 per cent of single women in London were migrants in 1583-86, a proportion that had fallen to 53 per cent in 1601-05, and 38 per cent by 1630-40.[573] Although lower than the proportions for apprentices, the marriage licence data confirm that in-migration was very important in London during the late sixteenth and early seventeenth century.

The decline in the percentage of migrants among apprentices in the eighteenth century was probably linked to the slow-down in population growth in the country at large, although Table 15 indicates that there was little or no change in London's share of the national population between 1650 and 1801, suggesting that London's increase was hampered by the high infant and child mortality in this period. However, mortality fell sharply after the end of the eighteenth century, engendering a rapid endogenous growth in population with minimal inward migration.

Discussion

The reasons for the patterns of mortality discussed in this paper must be largely speculative, given the absence of detailed work on the history of disease mortality in London during this period. The more than doubling of infant and child mortality between the sixteenth and the middle of the eighteenth century was not mirrored by a similar increase in adult mortality during the same period. Early mortality appears to have increased significantly in all socio-economic groups in the period 1550-1750, suggesting that changes in the standard of living did not play a significant role in shaping mortality patterns, particularly as this was a

[573] The first 200 marriages were selected for analysis in each of the periods 1583-86, 1601-05 and 1630-40 from Armytage, *Allegations.*

period when real incomes were rising generally in London and elsewhere.

There is evidence that some diseases became more virulent during the period 1550-1850. Most people dying from smallpox in London during the sixteenth, seventeenth and eighteenth centuries were children, indicating that the disease was endemic, affecting everyone born in the city.[574] The case-fatality rate of smallpox in two London parishes during the sixteenth century was approximately 5 per cent,[575] compared to a case-fatality rate of about 45 per cent amongst unvaccinated children in London in the 1880s.[576] There is considerable evidence that smallpox became more fatal in London throughout the seventeenth, eighteenth and nineteenth centuries[577] – possibly as a result of the importation of more virulent strains with the growth of world trade world – and this could explain in part the increase in infant and child mortality up to the middle of the eighteenth century. Inoculation and vaccination were practised in London after that period, although it is doubtful whether they made a major impact, particularly among the poor, until the end of the eighteenth century.[578]

---

[574] See T.R. Forbes, *Chronicle from Aldgate*, 1971; R. Hoveden, *The Register of Christenings, Marriages and Burials of the Parish of Allhallows London Wall, 1559-1675*, 1878; J. Landers, 'Age patterns of mortality in London during the long eighteenth century: a test of the high potential model of metropolitan mortality' *Social History of Medicine*, Volume 3, 1990, p. 53.

[575] Forbes found in his study of the parish of Aldgate that there were 117 death from smallpox out of a total of 5,309 – 2.2 per cent – during 1583-99. 83 of the 117 deaths – 71 per cent – were under the age of ten, and as there were 3,236 baptisms in the parish during this period, this indicates a case-fatality rate of about 4 per cent. See Forbes, *Chronicle*. There were 12 deaths from smallpox in Allhallows London Wall during 1574-98, 10 of which were under the age of 7, with 442 baptisms in the parish during this period, indicating a case-fatality rate of under 5 per cent. See Hovenden, *The Register*.

[576] P. Razzell, *The Conquest of Smallpox,* 2003, pp. 168, 177.

[577] Ibid, pp. 166-78.

[578] Ibid, pp. 74, 96, 97.

The disappearance of the plague in the 1660s does not appear to have made a significant long-term impact on mortality in London. It is possible that this was because other diseases were replacing plague as a cause of death. We have seen that smallpox was becoming more fatal to children, and this was probably true of certain other diseases. Typhus was probably introduced into England in the sixteenth century,[579] it affected adults more than children,[580] killed rich and poor alike, and became widespread in both town and countryside during the seventeenth century.[581] In London, diseases classified by contemporaries as fevers increased significantly during this period. Fever and ague accounted for about 6 per cent of all deaths in Aldgate during the period 1583-99, most deaths occurring among adolescents and adults.[582] According to the London Bills of Mortality, about 15 per cent of all deaths were due to fever in the first half of the eighteenth century, again most of them adults.[583]

There was a fall in the number of fever deaths among adults in London and elsewhere during the second half of the eighteenth century,[584] and much of this reduction in mortality was probably linked to the gradual elimination of typhus infection. Woollen underwear was replaced by linen and cotton garments during this period, and more effective washing –

---

[579] H. Zinsser, *Lice and History*, 1963, p. 279.

[580] A.J. Saah, 'Rickettsia prowettsia (epidemic louse-borne typhus)', in G.L. Mandell, J.E. Bennett, R. Dolin (eds.), *Principles and Practice of Infectious Diseases*, Volume 2, 2000; C. Creighton, *A History of Epidemics in Britain*, Volume 2, 1965, p. 47.

[581] Creighton, *A History*, Volume 2, pp. 30-33. The environmental conditions favourable to the spread of typhus appear to have been present in England well before the sixteenth century. Body lice continued to be prevalent in both town and countryside into the eighteenth and nineteenth centuries.

[582] Forbes, *Chronicle.*

[583] Vann and Eversley, *Friends*, pp. 212-15, 234.

[584] Ibid, p. 234. Schwarz has noted the decline of mortality from fever, smallpox, and consumption and the diseases of infancy in London during the eighteenth century. See L. Schwarz, 'Review article death in the eighteenth century', *Continuity and Change*, Volume 11, 1996, p. 300.

involving the boiling of clothing – was probably responsible for the progressive elimination of both body lice and typhus.

In addition to inoculation and the introduction of linen and cotton garments, there were a number of other improvements which may have helped reduce mortality, e.g. the use of colostrums in breastfeeding after the middle of the eighteenth century.[585] However, many of these improvements would have been adopted first by the wealthy and then only later by the general population, and the evidence on the fall in mortality is that it affected all socio-economic and all age groups from the middle of the eighteenth century onwards. A study of the Bills of Mortality and parish registers which list cause of death suggests that a range of diseases diminished during the latter half of the eighteenth and first half of the nineteenth century – smallpox, fevers (probably including typhus and typhoid fever) and convulsions (probably including diarrhoea/gastrointestinal diseases).[586] Most of these are dirt diseases and it is possible that there was a transformation of the environment in the middle of the eighteenth century which had a major impact on disease incidence. Roy Porter wrote of the 'cleaning of the Great Wen' during this period, associated with a number of Local Improvement Acts which appeared to have transformed London's overall disease environment.[587]

The economic and social consequences of London's population growth have been well-documented by Fisher, Wrigley and others.[588] London provided an expanding market for a range of agricultural and industrial commodities, and was a

---

[585] Creighton, *A History,* p. 14

[543] R. Forbes, 'Births and deaths in a London parish: the record from the registers', *Bulletin of the History of Medicine*, Volume 55, 1981, p. 390; Vann and Eversley, *Friends*, p. 218; J. Landers, A. Mouzas, 'Burial seasonality and causes of death in London, 1670-1819' *Population Studies*, Volume 42, 1988, p. 64.

[587] R. Porter, 'Cleaning up the Great Wen: public health in eighteenth century London', *Medical History Supplement Number 11*, 1991.

[588] See F.J. Fisher, *London and the English Economy, 1500-1700*, 1990; Wrigley, 'A simple model'; Beier and Finlay (eds.), *London.*

major centre of manufacturing activity.[589] Its national and international trade laid the foundation for subsequent industrialization, and it acted as a focal point for the dissemination of a more cosmopolitan way of life.[590] None of this would have been possible without population growth, and the inverted U-shaped cure of economic and social development – rapid expansion between 1520 and 1650, followed by a long period of stagnation and subsequent rapid growth at the end of the eighteenth century – would not have occurred without a similar cycle of exogenous demographic development, both in London and nationally.[591]

Conclusion

The overall conclusions to be reached on the history of mortality in London from this research are as follows:

1. Infant and child mortality more than doubled between the sixteenth and the middle of the eighteenth century in both wealthy and non-wealthy families.
2. Mortality peaked in the middle of the eighteenth century at a very high level, with nearly two-thirds of all children – rich and poor – dying by the time of their fifth birthday.

---

[589] See J.A. Chatres, 'Food consumption and internal trade' in Beier, Finlay, *London*.; A.L Beier, 'Engine of manufacture: the trades of London', in Beier and Finlay, *London*.

[590] Wrigley, 'A simple model'; Beier and Finlay, *London*. Not only did the population increase in London during the sixteenth and early seventeenth centuries have economic and social consequences for the country at large, but it probably had a significant influence on political developments in the mid-seventeenth century. The City of London provided critical financial and military support for the Parliamentary cause – the City's trained bands constituted the core of the early Parliamentary army. See S. Porter (ed.), *London and the Civil War*, 1996.

[591] There is evidence that the cyclical fluctuations in mortality in London were also found in the country at large. See P. Razzell. 'Population, poverty and wealth: the history of mortality and fertility in England, 1550-1850', Razzell, *Population and Disease*.

3. Mortality under the age of two fell sharply after the middle of the eighteenth century, and older child mortality decreased mainly during the late eighteenth and early nineteenth century. By the second quarter of the nineteenth century, about thirty per cent of all children had died within the first five years. This latter fall in mortality appears to have occurred equally among both the wealthy and the non-wealthy population.
4. There was little or no change in paternal mortality from 1600 to the first half of the eighteenth century, after which there was a steady fall until the middle of the nineteenth century. The scale of the reduction in paternal mortality was probably less than the fall in infant and child mortality. The latter more than halved between the middle of the eighteenth and nineteenth centuries, whereas paternal mortality fell by above a third in the same period.
5. There appears to have been a minimal social class gradient in infant, child and adult mortality in London during the period 1550-1850. This is an unexpected finding, raising fundamental questions about the role of poverty and social class in shaping mortality in this period.[592]
6 Although migration played a leading role in fostering population increase in London during the sixteenth and early seventeenth centuries, relatively low infant and child mortality made a major contribution to population growth in this period.

The absence of a general link between wealth and mortality has been one of the major findings of this paper. The research has also found an inverted U-shaped pattern of long-term infant and child mortality, with mortality more than doubling between the sixteenth and the middle of the eighteenth century, before falling sharply after this period. These findings represent a radical challenge to conventional assumptions about London's mortality

[592] For a discussion of the role of wealth in shaping adult mortality see Razzell and Spence, 'The hazards of wealth'.

history. However, the explanations and implications of these demographic patterns have yet to be fully explored and only detailed further reconstitution research on individual parishes – particularly with those with information on cause of death, age and occupation in the burial register – will answer some of these outstanding questions.

Chapter 7: Population Growth and the Increase of Socio-Economic Inequality in England, 1550-1850.[593]

Introduction

Malthus: 'Farmers and capitalists are growing rich from the real cheapness of labour'.[594]

In 1965, H.J. Habakkuk presented a 'heroically simplified version of English history' elaborating the role of population growth:

> ... long-term movements in prices, in income distribution, in investment, in real wages, and in migration are dominated by changes in the growth of population. Rising population: rising prices, rising agricultural profits, low real incomes for the mass of the population, unfavourable terms of trade for industry – with variations depending on changes in social institutions, this might stand for a description of the thirteenth century, the sixteenth century, and the early seventeenth, and the period 1750-1815. Falling or stationary population with depressed agricultural profits but higher mass incomes might be said to be characteristic of the intervening periods.[595]

It is not possible to test Habakkuk's thesis in any detail because there is no consensus on economic trends and changes in the economy during the early modern period. Attempts have been made by economic historians to resolve these difficulties by adopting mathematical models, but these have resulted in

---

[593] Unpublished paper.
[594] T.R. Malthus, *An Essay on the Principal of Population*, 1989, p. 28.
[595] H.J. Habbakuk 'The economic history of modern Britain', in D.V. Glass, D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography*, 1965, p. 148.

significantly different conclusions. For example, there is a fundamental disagreement between Gregory Clark on the one hand, and Stephen Broadberry and colleagues on the other about long-term economic growth in England in the period between the fifteenth and early the nineteenth century. The former concluded that there was no significant change in per capita incomes in this period, whereas Broadberry et.al. have argued that GDP per head approximately doubled in the same period.[596] The different conclusions are the result of disagreements on estimates of population, the impact of technology, employment levels, the incomes of women and children, changing occupational structure, and the effect of enclosures on the demand for labour. The problem is that there is no reliable national evidence to evaluate competing ideas, and attempts to resolve these difficulties have led to the use of models which necessarily require a range of arbitrary assumptions. As E.P. Thompson demonstrated, the lack of reliable national evidence has bedevilled the long standard of living debate, which is unlikely to ever be resolved by econometric analysis.[597]

In his study of income and wealth inequalities, Thomas Piketty has written that:

> For far too long economists have sought to define themselves in terms of their supposedly scientific method. In fact, those methods rely on an immoderate use of mathematical methods ... the new

[596] G. Clark 'The long march of history: farm wages, population, and economic growth, England 1209-1869', *Economic History Review*, 60, 2007, pp. 97-135; S. Broadberry, B.M.S. Campbell, A. Klein, M. Overton, B. Van Leewen, *British Economic Growth, 1270-1870*, 2015. There are similar disagreements amongst economic historians about the growth of labour productivity during the period 1759-1831: Crafts and Harley estimate that average labour productivity in British industry grew by 0.26% a year in the period 1759-1801, and 0.21% from 1801 to 1831, whereas the corresponding estimates from Broadberry, Campbell, and van Leeuwen are 0.63% and 0.68%.' M. Kelly, C. O'Grada, 'Adam Smith, watch prices, and the industrial revolution', *The Quarterly Journal of Economics*, 2016, pp. 1728, 1729.

[597] E.P. Thompson, *The Making of the English Working Class*, 1966, pp. 189-349.

> methods often lead to a neglect of history and of the fact that historical experience remains our principle source of knowledge.[598]

Piketty has quoted historical evidence for England, including the structure of income and wealth in the early nineteenth century through the works of Jane Austen. This paper seeks to place the debate about socio-economic inequality in a broader historical context, in part by evaluating the relationship between population and socio-economic status in England from the sixteenth century onwards. Given the lack of consensus on national economic trends, it will only be possible to examine whether the historical evidence is consistent with Habakkuk's thesis, without analysing all the other possible factors influencing socio-economic inequality and levels of real income.

There is one fundamental issue largely neglected by the participants in the debate about the standard of living. This was summarized by the historian John Lovell when discussing J.L. and Barbara Hammond's work on the impact of industrialisation on the life of labourers in the period 1760-1832:

> ... if population growth was caused by factors independent of the economy – if in other words it was an independent variable – then it becomes possible to regard the industrialization process as one that was vitally necessary for the welfare of the mass of the population, for if there had been no rapid expansion of economic activity, no leap forward in productivity, then the growth of numbers would ultimately have produced a crisis of subsistence. Such a crisis of subsistence did in fact occur in one part of the British Isles where the growth of population was not matched by that of industry. This was in Ireland, where the pressure of population resulted in small famines in 1817-18 and 1822 and a catastrophic famine in 1846.[599]

---

[598] T. Piketty, *Capital in the Twenty-First Century*, 2014, pp. 574, 575.

[599] J.L. and B. Hammond, *The Town Labourer 1760-1832*, 1978, p. xii. Connell estimated that the population of Ireland increased from 2,167,000 in 1687 to 4,753,000 in 1791. See K.H. Connell, *The Population of Ireland, 1750-1845*, 1950, p. 25.

Lovell's argument has some validity, but it does not entirely resolve the debate between optimists and pessimists. There may have been no famines in England in this period, but this does not resolve the issue of changes in the overall standard of living. Additionally, it does not answer the question of what were the consequences of population growth for socio-economic inequality?

The History of English Population Growth.

The population of England had approximately doubled in the first half of the nineteenth century, and existing evidence indicates that population had grown from the middle of the eighteenth century onwards.[600] Most economists have assumed the primacy of economics over demography, reflecting the views of Malthus who in his theoretical work emphasized the impact of economic factors on fertility and population levels, through shifts in the incidence of marriage.[601] Although Malthus's theory of population stressed the economic basis of marriage and fertility − a growth in income leading to earlier marriage and a rise in fertility − in his account of England's experience he reversed his analysis. He concluded that mortality associated with the disease environment was the key driver of population growth, and a review of the evidence for the eighteenth and early nineteenth centuries confirms this conclusion.[602]

---

[600] E.A. Wrigley, R.S. Schofield, *The Population History of England and Wales*, 1981; P. Razzell, 'Malthus: mortality or fertility: the history of English population in the eighteenth century'.

[601] Malthus, *An Essay*, 1989, Vol. 1, pp. 15, 92, 192, 193.

[602] Malthus, *An Essay*, 1989, p. 311; Razzell, Malthus: Mortality or Marriage?'.

Population Change and Levels of Real Income and Socio-Economic Inequality

Although there is no definitive general national data, there is statistical and literary evidence for individual periods that can be used to illuminate the relationship between population change and socio-economic inequality. The second half of the sixteenth century was a period of rapid population growth and an increase in prices. There are some estimates that population grew by over 30 per cent in the period 1570-1609 and prices more than doubled between 1550 and 1600.[603] Lawrence Stone noted the changes that had taken place in English society during the sixteenth century as a result of population growth: 'the excess supply of labour relative to demand not only increased unemployment, but forced down real wages to an alarming degree ... [there was] a polarisation of society into rich and poor: the upper classes became relatively more numerous and their real incomes rose; the poor also became more numerous and their real incomes fell.'[604]

Recent research by Alexandra Shepard using church court depositions indicates that wealth inequality increased markedly during the sixteenth and seventeenth century. In the mid-sixteenth century the mean wealth of yeomen was £9.88; by the second quarter of the seventeenth century it had risen to £143.06. By contrast labourers' average wealth rose from £2.03 to £4.75,

---

[603] E.A. Wrigley, R.S. Schofield, *The Population History of England and Wales*, 1981; B.R. Mitchell, P. Deane, *Abstract of British Historical Statistics*, 1971, pp. 484-486; J. Thirsk, 'The farming regions of England' in J. Thirsk, (ed.), *The Agrarian History of England and Wales, 1500-1640*, 1967, pp. 857, 858, 1861; E.H. Phelps-Brown, S.V. Hopkins**,** 'Seven centuries of the prices of consumables compared with builders' wage rates' in E.M. Carus-Wilson (ed.), *Essays in Economic History, Volume 2,* 1962, pp. 193-195.

[604] L. Stone, 'Social mobility in England, 1500-1700', *Past and Present*, Volume 33, 1966, pp. 26-29, 49.

and allowing for inflation, the real wealth of labourers diminished during this period.[605]

After a period of stagnation in the second half of the seventeenth and first half of the eighteenth century, population began to grow from the middle of the eighteenth century, accelerating rapidly at the end of the eighteenth and beginning of the nineteenth century.[606] There is no current consensus on the changing pattern of real income and economic inequality during the seventeenth and eighteenth centuries.[607] In the absence of reliable general statistical data, it is necessary to turn to literary evidence. Keith Snell has concluded that 'there was no doubt among contemporaries that real wages fell in the southern (and many Midland counties) [in 1760-1830].'[608] He quoted an extensive bibliography to support this conclusion, and added that 'the list could be considerably extended, and there were virtually no contrary opinions.'[609]

Although not definitive, the increasing poverty of labourers and the poor can be illustrated through autobiographical evidence which has a degree of authenticity by its immediacy and directness. This includes that from Admiral Horatio Nelson, who had no ideological interest in exaggerating the poverty of labourers. In a letter to the Duke of Clarence in 1790 he described the condition of the poor in Norfolk:

> That the poor labourer should have been seduced by promises and hopes of better times, your Royal Highness will not wonder at, when I assure you, that they are really in want of everything to make life

[605] A. Shepard, *Accounting for Oneself, Worth, Status and the Social Order in Early Modern England*, 2015, pp. 68-72.
[606] Wrigley, R.S. Schofield, *The Population*; Razzell, *Mortality.*
[607] J. Humphries, 'The lure of aggregates and the pitfalls of the patriarchal perspective: a critique of the high wage economy interpretation of the British industrial revolution', *Economic History Review*, 66, 2013, pp. 693-704; P.H. Lindert, 'When did inequality rise in Britain and America?' *Journal of Income Distribution*, 9, 2000.
[608] K.D.M. Snell, *Annals of the Labouring Poor,* 1985, p. 25.
[609] Ibid.

> comfortable. Hunger is a sharp thorn, and they are not only in want of food sufficient, but of clothes and firing.[610]

Nelson also claimed that labourers could not afford candles, soap or shoes, and for 'drink nothing but water, for beer our poor labourers never taste.'[611]

One of the most detailed and reliable accounts was provided by the Reverend John Howlett, who had been the Vicar of Great Dunmow in Essex for about 50 years. Describing the condition of labourers he wrote in 1796:

> … for the last forty or fifty years, some peculiarly favoured spots excepted, their condition has been growing worse and worse, and is, at length, become truly deplorable. Those pale famished countenances, those tattered garments, and those naked shivering limbs, we so frequently behold, are striking testimonies of these melancholy truths.[612]

He argued that these developments were the result of 'the rapid increase of population on the one hand and from the introduction of machines and variety of inventions … [which have led to] more hands than we are disposed or think it advantages to employ; and hence the price of work is become unequal to the wants of the workmen.'[613] He compiled figures of income and expenditure in his parish, using details of wages from farmers' wage books and local knowledge of family incomes and consumption, for the two ten-year periods, 1744-53 and 1778-87. The annual expenditure per family in the first period was £20.11s.2d and earnings £20.12.7d, leaving a surplus of 1s.5d. In

---

[610] N.H. Nicolas, *The Dispatches and Letters of Vice Admiral Lord Viscount Nelson, Volume 1, 1777-94*, 1845, p. 295.
[611] T. Coleman, *Nelson*, 2002; Nicholas, *The Dispatches*, p. 297.
[612] J. Howlett, *Examination of Mr Pitt's Speech in the House of Commons … February 12th, Relative to the Condition of the Poor*, 1796, p. 2
[613] Ibid, p. 19. Technology was clearly important in displacing labour during the eighteenth and nineteenth centuries, but this issue is beyond the scope of the present paper.

the second period the figures were £31.3s.7d and £24.3.5d, leaving a deficit of £7.0s.2d.[614] Howlett concluded that

> Of this deficiency the rates have supplied about forty shillings; the remaining £5 have sunk the labourers into a state of wretched and pitiable destitution. In the former period, the man, his wife, and children, were decently clothed and comfortably warmed and fed: now on the contrary, the father and mother are covered with rags; their children are running about, like little savages, without shoes or stockings to their feet; and, by day and night, they are forced to break down the hedges, lop the trees, and pilfer their fuel, or perish with cold. [615]

Much of the decline in real incomes was the result of increasing prices, and Table 1 suggests that some of the price increases were the result of growing demand resulting from population increase. Bread was a staple food for the poor and 'constituted about 44 per cent of total family expenditure in the 1760s but this had risen to about 60 per cent by 1790.'[616] 'Not wages, but the cost of bread, was the most the most sensitive indicator of popular discontent ... Any sharp rise in prices precipitated riot.'[617] The price of bread was used under the Speenhamland system to subsidise wages. The price of bread is therefore central to the analysis of the relationship between increasing population and changes in prices. Information on the price of bread in London is available for the whole of the eighteenth and first half of the nineteenth century, and the following table summarises data on its association with population growth.

---

[614] Ibid.
[615] Ibid, p. 49. For budgets of labouring families in 1796 which showed an almost universal deficit of expenditure over income, see D. Davies, *The Case of Labourers in Husbandry*, 1796, pp. 7, 176-227; F.M. Eden, *The State of the Poor*, Volume 3, 1797, pp. cccxxxix-cccl. Davies and Eden compiled between them budgets in twenty-three counties of England.
[616] Snell, *Annals*, p. 26.
[617] Thompson, *The Making*, p. 63.

Table 1: The Relationship between Increasing Population and the Price of Bread in London.[618]

Period	Mean Population of London	Mean Price of 4lbs of Bread in London (Pence)
1700-49	625,00	5.1
1750-99	788,000	6.4
1801-51	1,631,000	10.7

Although only one of a number of possible explanatory factors,[619] Table 1 suggests that the increasing demand resulting from the growth of population had a major impact on the price of bread.

Cobbett presented detailed evidence of the pauperisation of labourers at the end of the eighteenth century. By 1805 he came face to face with the poverty of southern agricultural workers:

> The clock was gone, the brass kettle was gone, the pewter dishes were gone; the warming pan was gone … the feather bed was gone, the Sunday-coat was gone! All was gone! How miserable, how deplorable, how changed the Labourer's dwelling, which I, only twenty years before, had seen so neat and happy.[620]

He linked the pauperisation of labourers with the decline of the living-in system and the increasing wealth of farmers:

> [The] farm-house was formerly the scene of plain manners and plentiful living. Oak clothes-chests, oak chest of drawers, and oak tables to eat on, long, strong, and well supplied with joint stools … there were, in all probability, from ten to fifteen men, boys and

[618] E.A. Wrigley, 'A simple model', p. 44; B.R. Mitchell, P. Deane *Abstract of British Historical Statistics*, 1971, pp. 497, 498. The population figures are the averages between the population numbers in 1700, 1750, 1801 and 1851.
[619] For the range of possible explanatory factors see J.L. and B. Hammond, *The Town Labourer 1760-1832*, 1995, pp. 102-110.
[620] W. Cobbett, *Rural Rides*, 2001, p. x.

> maids … [but now] a *parlour*! Aye, and a carpet and bell-pull too! ... [and a] mahogany table, and the fine chairs, and the fine glass … And … decanters, the glasses, the 'dinner set' of crockery ware … it [is now] *Squire* Charington and the *Miss* Charingtons … transmuted into a species of mock gentle-folks … [621].

Although there is no reliable national statistical data to support the local and literary evidence, there is some data for southern and western counties which indicates that there were sharp falls in the real incomes of poor men and women in the late eighteenth and early nineteenth century. Snell has compiled figures of the annual wages of southern and western farm and domestic servants taken from poor law settlement examinations. These figures cover the whole period 1741-1840, and have the advantage of relying on direct witness statements. They focus on unmarried young men and women hired by the year, which conferred poor law settlement. They relate to employment for the whole year, and were paid at the end of the year, addressing the major difficulty of establishing changing unemployment levels. These categories of worker were boarded and lodged during the year, so in that sense were safeguarded from many of the effects of price fluctuations. Frequently their statements were checked by parish authorities, providing some independent surety for their reliability. There is some evidence from other sources which suggests that these trends proximate to weekly wage trends affecting other largely unskilled rural and market-town workers in these southern and western English counties, which covered about sixty per cent of the total population of England.[622]

[621] Ibid, pp. x, xviii, 358.
[622] Snell, *Annals*, pp. 23-28; Mitchell and Deane, *Abstract*, p. 20.

Table 2: Mean Real Wages (£) of Farm and Domestic Servants in Southern and Western Counties, 1741-1840.[623]

Period	Mean Real Male Annual Wages (£)	Mean Real Female Annual Wages (£)
1741-50	7.398	4.802
1751-60	5.919	4.546
1761-70	7.994	4.532
1771-80	7.361	4.226
1781-90	7.751	4.007
1791-1800	6.614	3.541
1801-10	5.212	3.319
1811-20	4.9	3.574
1821-30	5.43	4.421
1831-40	4.828	4.086

Male mean wages were more-or-less constant in the period between 1741 and 1790 but fell sharply in the period 1791-1840. Female real wages fell gradually from the 1740s onwards, with a slight recovery in the two decades between 1821 and 1840.

The Captain Swing riots in 1830 occurred widely in southern and eastern counties, and according to Hobsbawm and Rude 'the basic aims of the labourers were singularly consistent: to attain a minimum living wage and to end rural unemployment ... [much of it the result of] a permanent surplus of labour ... due in the first instance to the growth of population.'[624]

There is some evidence that wealth became more unequally distributed in the late seventeenth and eighteenth centuries. Clark has summarized data from wills in Essex, Kent, Buckingham, Surrey and Suffolk in the seventeenth and eighteenth centuries:

---

[623] Snell, *Annals*, pp. 23-28; E.H. Phelps-Brown, S.V. Hopkins 'Seven centuries of the prices of consumables, compared with builders' wage rates' in E.M. Carus-Wilson (ed.), *Essays in Economic History,* Volume 2,.1962.
[624] E.J. Hobsbawm, G. Rude**,** *Captain Swing*, 1973, pp. 22, 163.

> In the farming sector there is an almost complete disappearance of what would be a growing agricultural proletariat from probate records. In the seventeenth century there were only 0.55 yeomen for every husbandman/labourer. This ratio moved dramatically in favour of yeomen: 1600-49: 1.37; 1650-99: 2.7; 1700-69: 4.6.[625]

This suggests that not only labourers and husbandmen were becoming increasingly impoverished, but that yeoman farmers were growing wealthier. This is also indicated by evidence on agricultural occupations in Cambridgeshire and Bedfordshire.

Table 3: Percentage Distribution of Wills in Cambridgeshire and Bedfordshire, 1601-1800.[626]

Period	Farmers & Yeomen	Husbandmen	Labourers & Servants	Number of Wills
1600-1649	42.0%	27.8%	29.8%	2023
1650-1699	65.6%	17.6%	16.9%	2000
1700-1749	64.7%	16.0%	19.3%	2409
17500-1799	82.1%	8.5%	9.5%	1495

[625] G. Clark, 'The consumer revolution: turning point in human history, or statistical artifact', *Department of Economics, University of California, Davis, Working Paper*, 2010.

[626] The data for Cambridgeshire is taken from N. Evans, 'Occupations and status of male testators in Cambridgeshire, 1550-1750', in T. Arkell, N. Evans, N. Goose (eds.), *When Death Do Us Part*, 2000, p. 181; the Bedfordshire material is derived from P. Razzell, C. Spence, M. Woollard, 'The evaluation of Bedfordshire burial registration, 1538-1851', *Local Population Studies,* 84, 2010. Labourers and husbandmen who left wills were much poorer than yeoman and farmers. In 1585-1638 in Essex, Kent, Buckingham, Surrey and Suffolk the average assets bequeathed by yeomen/farmers was £406, whereas that bequeathed by husbandmen was £87 and that by labourers £42. See G. Clark, G. Hamilton, 'Survival of the richest; the Malthusian mechanism in pre-industrial England', *Journal of Economic History*, 66, 2006, p. 11. In a sample of inventories from eight parts of England in 1675-1725, the equivalent figures were: Yeomen/Farmers £165, Husbandmen £32, Labourers £16. L. Weatherrill, *Consumer Behaviour and Material Culture, 1660-1760*, 1988, p. 212.

the changing distribution of occupations is consistent with the increasing pauperisation of labourers and the growing wealth of farmers in the South of England.

There is also evidence that wealthy families came to dominate elite occupations in the late eighteenth and early nineteenth century.[627] For example, the proportion of East Indian Company army officers from the landed gentry rose from six per cent in 1758-1774 to nineteen per cent in 1805-1834; the equivalent figures for the aristocracy were two to five per cent.[628]

Real wages were higher in the North of England as a result of industrialization in the nineteenth century,[629] but there is some evidence that the pauperisation of the working class was not confined to the South of England.[630]. Charles Shaw in his autobiography described the conditions of workers in the Staffordshire Potteries in the 1830s and 1840s:

> All the great events of the town took place … [in] the market place. During the severity of winter I have seen one of its sides nearly filled with stacked coals. The other side was stacked with loaves of bread, and such bread. I feel the taste of it even yet, as if made of ground straw, and alum, and Plaster of Paris. These things were stacked there by the parish authorities to relieve the destitution of the poor. Destitution, for the many, was a chronic condition in those days, but when winter came in with its stoppage of work, this destitution became acute, and special measures had to be taken to relieve it. The crowd in the market-place on such a day formed a ghastly sight. Pinched faces of men, with a stern, cold silence of manner. Moaning women, with crying children in their arms, loudly proclaiming their sufferings and wrongs. Men and women with loaves or coals, rapidly

---

[627] P. Razzell, *Population and Disease: Transforming English* Society, 2007, pp, 236-239.
[628] Ibid, p. 236.
[629] J. Caird, *English Agriculture in 1850-51*, 1968; Mitchell and Deane, *Abstract*, pp. 346, 347; E.H. Hunt, 'Industrialisation and regional inequality in Britain, 1760-1914', *The Journal of Economic History*, 46, 1986.
[630] P. Razzell, R. Wainwright, *The Victorian Working Class*, 1973, pp. xix-xxiv.

> departing on all sides to carry some relief to their wretched homes − homes, well, called such … This relief, wretched as it was, just kept back the latent desperation in the hearts of these people.[631]

Not all workers were resigned to the poverty they experienced at this time. John Buckmaster described in his autobiography the political turmoil that occurred in Buckinghamshire during the 1830s:

> Numbers of men were out of work, bread was dear, and the Chartist agitation was violently active. Copies of the *Northern Star* and other Chartist papers found their way into every workshop. Meetings were held almost every evening and on Sundays. Some of the speeches advocated physical force as the only remedy … Lectures on Peterloo, the Bristol Riots, the Monmouth Rising, and the Pension List were common. Bad trade, low wages, and dear bread were the stimulating causes of widespread discontentment. Men were driven to their lowest depth of hatred of the governing classes ... the country was passing through the throes of a political convulsion which was fast ripening into a revolution. The mechanics institute gradually degenerated into a violent revolutionary club.[632]

Underlying many of these conditions were the increasing employment of cheap labour.[633] In 1809, the abolition of protective legislation had allowed the increasing employment of children and unskilled workers in the new factories.[634] Over 80 per cent of the labour force in English and Scottish factories in 1833 was women and children, paid about a third of the wages of male workers.[635]

---

[631] C. Shaw, *When I Was a Child*, 1980, pp. 42, 43.
[632] J. Buckmaster, *A Village Politician*, 1982 pp. 98, 99, 124, 153. For a detailed account of the political consequences of the pauperisation of the working class see Thompson, *The Making*.
[633] H. Mayhew, *The Morning Chronicle Survey,* 6 Volumes, 1980.
[634] Thompson, *The Making*, p. 529.
[635] J. Humphries, *Childhood and Child Labour in the British Industrial Revolution*, 2010; Razzell, *Mortality*, p. 106.

Not all the worst conditions were found in the new factories, they were often found in small sweated workshops and among garret masters working from home, described by Mayhew in such detail.[636] Many people were forced to work in these places because of an excess of labour. One of Mayhew's informants told him:

> The speculators find plenty of cheap labour among the country lads. A hand fresh up from the country can't get employment at the best shops, unless he's got some friends, and so, after walking all London, he is generally down to look for a job among the speculators at low wages.[637]

It was not just low wages, but a high incidence of unemployment that was the cause of much poverty. Mayhew stated that 'In almost all occupations there is ... a *superfluity of labourers*, and this alone would tend to render the employment of a vast number of the hands of a casual rather than a regular character. In the generality of trades the calculation is that one-third of the hands are fully employed, one third partially, and one-third unemployed throughout the year.'[638] One boot-maker in Mayhew's survey directly linked demographic trends with its impact on aggregate demand and increasing poverty levels:

> The cause of the trade being so overstocked with hands is, I believe, due in great measure to the increase in population. Every pair of feet there is born, certainly wants a pair of shoes; but unfortunately, as society is at present constituted, they cannot get them. The poor, you see sir, increase at a greater rate than the rich.[639]

A witness before the 1833 House of Commons Select Committee on the State of Agriculture stated that 'it is the surplus of labourers that are suffering, of which there are many in almost

---

[636] Mayhew, *The Morning Chronicle*.
[637] Ibid, Vol. 5, p. 108.
[638] Ibid, Vol.2, p. 300.
[639] Ibid, Vol. 3, p. 139.

every parish, and these men are very badly off … It used to be customary to have them [employed] for a whole year and employ them in the winter, but that is not the case now.'[640] A detailed account of the life of agricultural labourers was provided by the *Morning Chronicle Survey* in the middle of the nineteenth century:

> Their labour is at the command of anyone who bids for it; and as their employment is precarious, and their wages fluctuating, their lives are spent, in the majority of cases, in constant oscillation between their homes and the workhouse … If the reader will accompany me, I shall lead him into a cabin constituting the abode of [the labourer] …As you enter, a woman rises … and has an infant in her arms, and three other children … There are two boys who are out with their father at work … the mother takes a pot from the fire, and pours out of it a large dish of a quantity of potatoes. This together with a little bread and some salt butter for the father and the two eldest boys, forms the entire repast.[641]

The Growth of Capitalism

Many of the above developments were associated with the growth of capitalism, linked to the creation of labour surpluses resulting from population growth.[642] The development of capitalism in the sixteenth century can be illustrated by the economic activities of Shakespeare and his father John Shakespeare. The latter had carried out extensive trading

---

[640] M. Neuman, *The Speenhamland County: Poverty and the Poor Law in Berkshire 1782-1834*, 1982, p. 20.

[641] Razzell and Wainwright, *The Victorian*, pp. 3-5

[642] J. Whittle, *The Development of Agrarian Capitalism: Land and Labour in Norfolk, 1440-1580*, 2000; L. Shaw-Taylor, 'The rise of agrarian capitalism and the decline of family farming', *Economic History Review*, 65, 2012; C.K. Harley, 'British and European industrialisation' in L. Neal, J.G. Williamson (eds.), *Capitalism: Volume 1: The Rise of Capitalism from Ancient Origins to 1848,* 2014; Razzell, *Mortality*, pp. 99-108.

practices – the illegal sale of wool, lending of money and the hoarding of grain and other foodstuffs.[643] His son William was associated with these activities, and in 1598 was prosecuted for the illegal storage of grain. This practice however was carried out by nearly all the wealthy men in Stratford, along with the four local magistrates who were meant to enforce the legislation against the forestalling and hoarding of grain. This was a time when about 40 per cent of Stratford's population were designated as poor.[644]

At the end of the eighteenth century Cobbett described the further development of capitalism, arguing that bankers and city merchants played a significant role in the consolidation of estates and farms:

> The small gentry, to about the third rank upwards … are all gone, nearly to a man, and the small farmers with them. The Barings [merchant bankers] alone have, I should think, swallowed up thirty or forty of these small gentry without perceiving it … The Barings are adding field to field and tract to tract in Herefordshire; and as to the Ricardos, they seem to be animated with the same laudable spirit ... [acquiring a number of] estates … [645]

He further described the way the gentry and aristocracy employed urban stock brokers to speculate in stocks and shares, directly linking rural and urban capitalism,[646] which is confirmed by Stone's account of the economic activities of the aristocracy in the eighteenth and nineteenth centuries:

> By 1750 there were few great landlords who did not have some money – often a great deal – in the public funds of the Bank of England. In this sense they were themselves becoming inextricably linked with the monied interest, and their mental attitudes to

[643] P. Razzell, *William Shakespeare: The Anatomy of an Enigma*, 1990, pp. 16-20.
[644] Ibid, pp. 141-143.
[645] Cobbett, *Rural Rides*, p. 223.
[646] Ibid, pp, 6, 115.

> banking and stock speculation changed accordingly … Others poured surplus cash into canal companies and turnpike trusts in the eighteenth century, and into railroad companies and dockyards in the nineteenth. From the early seventeenth century onward many were deeply involved in urban development of London.[647]

The poverty of workers in factories was directly linked to the increasing wealth of the factory owners, described by an anonymous cotton spinner in 1818 as follows:

> … with very few exceptions, they [the employers] are a set of men who have sprung from the cotton-shop without education or address … but to counterbalance that deficiency, they give you enough of appearances by an ostentatious display of elegant mansions, equipages, liveries, parks, hunters, hounds … They bring up their families at the most costly schools … and to support all this, their whole time is occupied in contriving how to get the greatest quantity of work turned off with the least expense … the greater part of the master spinners are anxious to keep wages low … for the purpose of taking the surplus to their own pockets.[648]

This is essentially an illustration of the influence of capitalism on England's economic life. Harley has recently concluded that 'the emergence of Britain's modern growth depended more on a long history of capitalism than on the industrial revolution.'[649] The development of capitalism depended not only on the existence of a surplus of labourers but also on a number of political, social and economic factors.[650] However, population growth played a critical role in providing one of the necessary conditions – a large surplus of labour – which occurred at various periods in England's history between 1550 and 1850.

---

[647] L. Stone, *An Open Elite: England 1540-1880*, 1995, p. 189.
[648] Thompson, *The Making*, pp. 199, 200.
[649] C.K. Harley, 'British and European industrialisation' in L. Neal, J.G. Williamson (eds.), *Capitalism: Volume 1: The Rise of Capitalism from Ancient Origins to 1848*, 2014, p. 492.
[650] Razzell, *Mortality,* pp. 99-122.

Conclusion

Evidence reviewed in this paper is consistent with Habakkuk's thesis about the role of population growth in shaping levels of socio-economic inequality in England during the early modern period. Population growth was not shaped by economic factors but by changes in the disease environment, which resulted in significant falls in adult and child mortality. As a result, population played a major independent role in economic change between 1550 and 1850. Although only one of a number of possible factors, the evidence presented indicates that increasing population resulted in the creation of labour surpluses and a growth in aggregate demand. The consequence of England's growing population was an increase in inequality and poverty for the mass of its labouring population at different times in the early modern period, but particularly in the late eighteenth and the first half of the nineteenth century. This was the period of both rapid population increase and the growth of capitalism, resulting in increasing socio-economic inequality. However, the economic developments associated with capitalism also increased productivity, preventing the famine conditions that occurred in Ireland, which also experienced a significant increase in population but without an industrial revolution. In spite of rapid economic growth in England, the development of capitalism was associated with the increasing pauperisation of the poor at the end of the eighteenth and first half of the nineteenth century.

Chapter 8: Socio-Economic Status and Adult Mortality in England: a Historical Study, 1881-1891.[651]

Introduction

Currently, and throughout the twentieth century, there is clear evidence of a social gradient in adult mortality, in England and elsewhere.[652] The Registrar-General of England and Wales published figures for adult mortality ratios for men by occupationally defined social class for the period 1910-1953, which showed a social class gradient amongst men in 1910-12, with particularly large differences between Social Classes I and V. This persisted throughout the first half of the twentieth century, although it had diminished somewhat by 1949-53.[653] Inequalities widened again after 1970, and appear to have worsened even further in the 1990s, contributing to the current major concern over the health effects of social inequality.[654] Although there are various methodological debates about these trends, it seems clear from these reports of the Registrar General, and other sources, that a social gradient in mortality was a feature of twentieth century England.

Evidence for the nineteenth century is, however, less clear. Many contemporary commentators linked poverty with poor health and higher mortality amongst adults. However, much of the data for this conclusion was based on death

---

[651] Unpublished paper, written jointly with Emily Grundy.

[652] G. Davey Smith, D. Dorling, M. Shaw, *Poverty, Inequality and Health in Britain*, 2001; General Register Office, *Fifth Registrar-General's Annual Report, 1841,* pp. xxviii-xxxi; R.G. Wilkinson, K. Pickett, *The Spirit Level: Why Equality is Better for Everyone*, 2010; E. Chadwick, *Report on the Sanitary Condition of the Labouring Population of Great Britain*, 1965.

[653] J. Parker, C. Rollett, K. Jones in A.H. Halsey (ed.) *Trends in British Society since 1900*, 1971.

[654] Davey-Smith, *Poverty*; Wilkinson, *The Spirit Level.*

registers which did not take account of the population at risk, a flaw first pointed out by Farr in his discussion of life tables.[655] This critique is particularly relevant to the work of Chadwick, who used information from death registers on occupation and age at death to estimate mortality ratios, without allowing for the population at risk.[656]

Chadwick's work influenced a number of influential contemporary thinkers, including Engels and Mayhew.[657] Early reports from the Registrar-General which indicate occupational and social class differences in adult mortality during the nineteenth century,[658] also suffered from various difficulties. These include possible numerator-denominator bias as the population at risk is calculated from census information and the number of deaths from civil registration returns (a weakness also of twentieth century estimates), which use different methods of classification of data. Descriptions of occupations are also often ambiguous and difficult to classify, with heterogeneous variations within occupational categories, often locally based. Additionally, analyses of national data does not allow for the role of geographical place, which often had a significant influence on mortality.[659]

For example, clergymen and agricultural labourers both had low adult mortality rates in the late nineteenth and early twentieth century,[660] probably due to their residence in rural areas. Available data also does not cover all occupations, so that labourers – who were one of the most numerous and poorest occupational groups – are excluded from some analyses.[7]

---

[655] General Register Office, *Fifth Registrar-General's Annual Report, 1841,* pp. xxviii-xxxi

[656] Chadwick, *Report.*

[657] P. Razzell, *Population and Disease: Transforming English Society, 1550-1850*, 2007.

[658] R. Woods, *The Demography of Victorian England and Wales*, 2000.

[659] E. Garrett, A. Reid, K. Schurer, S. Szreter, *Changing Family Size in England and Wales: Place, Class and Demography, 1891-1911,* 2001.

[660] Woods, *The Demography*; *Supplement to the Registrar-General's Seventy-Fifth Annual report, Part IV: Mortality of Men in Certain Occupations in the Three Years 1910, 1911 and 1912.*

Farr's own investigation of mortality rates in London indicated no significant difference in mortality between wealthy and poor areas of London in 1838-44.[661] Neison also concluded from Insurance Company and Friendly Society records that there was no link between poverty and adult mortality.[662] However, the latter is subject to the problem of selection as results are based on those who chose, and could afford, to join and remain in Friendly Societies.

One way of partly dealing with these problems is to trace individuals directly through census, civil death register and other source material so avoiding numerator-denominator bias. Additionally, census data provide information on indicators of socio-economic status other than occupation and allow geographical factors to be taken into account. The potential of linked census and registration data has been explored to some extent in two previous small scale studies. In a study of forty-seven Bedfordshire parishes in the 1840s, tracking married couples between the 1841 and 1851 Censuses, results indicated that there was slightly higher mortality amongst professionals, merchants and gentleman than amongst labourers.[663] A similar methodology was employed in research on Ipswich in the 1870s, which suggested that adult mortality was higher in Social Classes I and II than in IV and V, although by the 1890s the position had been slightly reversed.[664]

In the study reported here we have extended this method and applied it to a national sample of married people enumerated in the 1881 Census. The methodological aim of the paper was to investigate tracing rates between census and other sources, principally registration of deaths, and the extent to which using census derived information on transitions from being married to being widowed can be used to extend identification of deaths.

---

[661] Razzell, *Population*, p. 136.
[662] Ibid, p. 220-23.
[663] Ibid, p. 201-02.
[664] Ibid, p. 204.

The substantive aim was to investigate the extent of social inequalities in adult mortality in late nineteenth century England.

Methods: Data.

We compared the mortality of two contrasting groups: 'elite' couples, defined as those with two or more domestic servants, and poor couples defined on the basis of husband's occupation as a labourer. The link between family income and the number of domestic servants has been widely documented for the period 1825-1906.[665] In general terms, the wealthier the family the greater the number and types of servant they employed, although this association is not perfectly linear.[666] The occupations of head of households in two-servant+ families identified in the current research are heavily concentrated in professional, business and landed families, although also including a number of farmers. Eight married couples were chosen from each county of England, four from each rural parish and four from each county town. We selected the first couple in the 1881 Census enumeration list with two or more domestic servants – designated as elite couples – and then the next family headed by a labourer, known to be one of the poorest occupational groups in England at the end of the nineteenth century.[667] This method of selection was repeated four times for each parish in the sample resulting in 156 elite and 156 labourer couples – and was adopted in order to compare

[665] B.S. Rowntree, *Poverty: a Study of Town Life*, 1901; J.A. Banks *Prosperity and Parenthood: a Study of Family Planning among the Victorian Middle Classes*, 1954; J. Burnett, *Plenty and Want*, 1968; P. Horn *The Rise and Fall of the Victorian Servant*, 1974; L. Schwartz, 'English servants and their employers during the eighteenth and nineteenth centuries', *Economic History Review*, 1999 Volume 52.
[666] E. Higgs, 'Domestic servants and households in Victorian England', *Social History*, Volume 8, 1983.
[667] Rowntree, *Poverty*; Burnett, *Plenty.*

well-defined groups with significantly different socio-economic profiles but the same geographic location.

Sample members were then traced in the 1891 Census, as well as in the civil register index of deaths. The methodology used involved triangulation between census, civil register, and probate sources. Tracing in the census was undertaken to identify those still alive (present in the census) and those whose death could be inferred by the fact that their spouse was present in 1891 but identified as widowed. Two family history sites were employed for this purpose. A first search was made using *Find My Past* and a second using *Ancestry*. It was necessary to use two sites because of the variable accuracy of the transcripts on which the family history indexes are based; variations in the spelling and presentation of birth places; inaccuracies in age reporting. Eighty-nine per cent of cases were traced through the *Find My Past* website, and a further eleven per cent in *Ancestry*.

In summary the following steps were carried out:

1. A search was made for the 1881 sample in the *Find My Past* 1891 census online index.
2. For unidentified cases, a further tracing exercise was carried out on the *Ancestry* 1891 census index.
3. A search was then carried out in the civil registration death index.

The civil registration death index contains information on the name of the individual, his or her age, the registration district in which the death was registered, and the quarter/ year of death. There is no information on kinship connections, occupation or other details which would facilitate identification and allow classification by socio-economic status.

Probate calendars usually provide information on place of death, address, exact date of death and kinship relationships but are only available for a proportion of the population with wealth to bequeath. These calendars have been digitized and indexed by the *Ancestry* family history site for the period 1861-1941, and this data was used to check assumptions about the identification of deaths. In order to trace husband and wives

between censuses the following key information is available in the censuses: 1. Name. 2. Age. 3. Birthplace. 4. Registration District. 5. Occupation. 6. Name, birthplace and age of children. Some of this information is also available in the death indexes – name, age and registration district of death.

There are a number of problems in linking census data for individuals, including the variable accuracy of the transcripts on which the family history indexes are based and the remarriage after widowhood especially for women changing their surname on remarriage. In cross-matching census data, a correct identification was assumed to take place when name, birthplace and age to within plus or minus five years were found to be the same. Other identifying information – such as spouse's and children's names, ages and birthplaces, plus occupational information – was also used where necessary. The research employed manual matching which inevitably employs an element of judgment, although the range of identifying information available is sufficiently great to minimize the impact of observer variation (and would suggest potential for computerised matching).

The major problem in the research however is the relative paucity of identifying information in the death indexes. If a person dies outside the registration district in which they were enumerated, it is very difficult to establish a reliable match from census to death index. It was therefore necessary to make recording of death in a previously identified enumeration district of residence a criteria for judging a link between a census and a death record (this was not a criteria in the census matching because of the wider range of information available in the census). Other matching criteria used were name and age.

Results

Table 1: Information on Tracing of Sample Couples in the 1891 Census.

Tracing in 1891 Census	Elite Couples	Labourer Couples	All Couples
Husband & Wife Both Traced	64.1%	65.4%	64.7%
Husband Traced As A Widower	8.3%	6.4%	8.0%
Wife Traced As A Widow	13.5%	8.3%	10.9%
Neither Traced	14.1%	16.0%	15.1%
Total Number Of Couples	156	156	312

Overall, it was possible to trace 84.9 per cent of all 1881 sample couples in the 1891 census through identification of one or both spouses. The remainder will include couples both of whom died or emigrated and transcription errors and variations in the presentation of matching information. Of 233 elite husbands and wives traced alive in the 1891 Census, 71 – 30.5 per cent – were located in a different registration district, whereas the equivalent figure for labourers' husbands and wives was 43 out of 237 – 18.1 per cent.

Identifying Deaths

Three methods were used to ascertain death of one or both members of a couple:

1. Widows and widowers were identified in the 1891 Census.
2. A search was made of the BMD civil register index of deaths.
3. An attempt was made to trace all identified deaths in the *Ancestry* probate calendar index.

As previously noted, the most difficult part of the research is the quality of the death register index and the limited information in it. Criteria for deciding on a match therefore included registration in the known census district of enumeration in 1881 and/or known enumeration district (of sample member of their surviving spouse) in 1891. In order to examine this assumption, an analysis was made of death entries for the spouses of husbands and wives who were listed as widowers and widows in the 1891 census. Of 61 such cases that occurred in the period 1881-1891, it was possible to trace 49 – 80.3 per cent – in the death register index. These findings illustrate the value of having two methods of measuring the incidence of deaths. Up to 20 per cent of deaths were not located in the death register index, but the data on widowers and widows allows us to correct for this deficiency. The latter information indicates that a death took place within a particular decade, whereas for about 80 per cent of cases it is possible to identify the exact quarter and year of death.

The above figures on the identification of deaths assume that a death that occurs within an appropriate enumerated registration district is correctly identified. In order to test this assumption a search was made in the *Ancestry* probate calendar index for all identified deaths cases, both those of spouses of surviving widows and widowers and those identified independently.

Table 2: Deaths Identified in the Civil Register Index Traced in the Probate Calendar Index, 1881-1891.

	Total Deaths Listed In Civil Register Index	Number Traced In Probate Calendar	Proportion Traced
Elite Males	24	21	87.5%
Elite Females	13	2	15.4%
Male Labourers	22	2	9.1%
Labourers' Wives	15	1	6.7%
Total	74	27	36.5%

As perhaps expected, it was possible to identify a much higher proportion of elite males in the probate calendar than other groups. In every case, the information in the calendar indicated that death register index entries were correct, in most cases listing the names of widows and widowers, along with details of address and other identifying information. The calendar entries include data on the amount of personal estate, which will be of value in classifying socio-economic status in future work.

Table 3: Adult Mortality among Couples in Elite and Labourers' Families, 1881-1891.

	Elite Husbands	Labourer Husbands	Elite Wives	Labourer Wives	Total
Number In 1881	156	156	156	156	624
Number Traced 1881-91	146	142	136	140	564
Number Alive In 1891 Census	115	117	121	121	474
Number Dead Through Census Tracking	23	16	14	15	20
Number Dead Through Civil Register	8	9	1	3	21
Proportion Dead Of Traced Cases	21.2%	17.5%	11.0%	12.9%	15.8%
Mean Age (Years) in 1881	48.0	43.0%	43.2	41.5	44.1

Table 3 summarizes the results discussed above, and shows the estimate of the proportion of each group who died 1881-1891 derived from these various sources. This suggests higher survival among women than men but little difference in the mortality of elite and labourer groups. However the distribution of the samples by age group varied slightly and the mean age of labourers (42.4) was slightly younger than that of the elite (45.6) (although the difference was not statistically significant). Results from a logistic regression model in which the outcome was dichotomised to alive/dead (and those untraced were excluded) and including age (single years), sex, elite/labourer status and rural or urban residence showed that odds of death did not vary significantly by elite/labourer status (or for labourers relative to elite: 1.06, 95% confidence interval 0.66-1.73). (Table 4)

Table 4: Logistic Regression of Adult Mortality among Couples in Elite and Labourers' Families, 1881-1891.[668]

	Odds Ratio	95% CI	P
Labourer (Ref. Elite)	1.068	0.658-1.732	NS
Women (Ref. Men)	0.679	0.416-1.108	NS
Age	1.062	1.043-1.081	<0.00

Table 4 shows, that as would be expected older age was associated with an increased risk of death by 1891, but that there was no significant difference between labourers and the elite.

Discussion

There is a well-established association between social class and adult mortality in England from the early twentieth century onwards. However, this association may not have been evident in

[668] Number = 590, excluding those not traced.

earlier periods raising questions about the pathways between social inequality and adult mortality in differing historical contexts.

For the present research, a national sample of 312 married couples was selected from the 1881 English Census comprising four elite and four labourer couples drawn from one urban and one rural parish in each county of England. Mortality 1881-1891 was ascertained through linkage to the 1891 Census and the civil register death index. About ninety per cent families were traced in the census or the death index. Results showed no significant differences between mortality of elite and labourer couples for either husbands or wives

These results illustrate firstly the potential for linking several data sources to provide more information about variations in mortality in the late nineteenth century. Triangulation was used in which transitions from being married to widowed were used to help identify deaths of spouses. However this method does have limitations. Firstly in both contemporary and historical populations it is known that the married have better health and lower mortality than the non married, so the sample is selected to some extent. Secondly, loss to follow up may be associated with death of both spouses. For these reasons and the way the sample was selected, it is not truly random, although the design meant that those included were matched geographically and so avoids problems of the distorting effects of place.

The extent, origin, and evolution of inequalities in health in England and elsewhere is a major topic of current debate in social policy and epidemiology, particularly as such inequalities appear to have widened in the last quarter of the twentieth century.[669] As noted by Wilkinson and Pickett, although social inequality was greater in earlier historical periods, there are some indications that these inequalities were not reflected in health differentials to the same extent as in contemporary

[669] Davey-Smith, *Poverty*; Wilkinson et.al., *The Spirit Level*.; J. Spijker, L. Van Wissen, 'Socioeconomic determinants of male mortality in Europe: the absolute and relative income hypothesis revisited', *Genus*, Volume 66, 2010.

populations.[670] Studies which have compared the aristocracy and the total population, for example, suggest that there were minimal associations between socio-economic status and adult mortality prior to and into the nineteenth century.[671] Preston and Haines also concluded from their analysis of child mortality in late nineteenth century America that differentials by level of income were not important.[672] More generally, Preston has argued that before the modern scientific understanding of how life style and personal health behaviour influence disease risks, the disease environment was more important than socio-economic status in shaping changing mortality patterns.[673]

Indeed greater material resources may have had some negative effects in enabling lifestyles including excessive consumption of high fat foods and alcohol and limited physical exercise.[674] There is evidence to suggest that the rural poor were forced to grow their own food, were unable to consume large amounts of alcohol because of their poverty, and were required to engage in intense physical activity as a result of their working conditions. By contrast, the wealthy are known to have consumed large amounts of rich food, alcohol and tobacco, and engaged in only in minimal amounts of physical activity because of the presence of household servants.[675] Thus in the nineteenth century for certain conditions, such as heart disease, there is some evidence of a reverse gradient (with richer people

---

[670] Wilkinson et.al., *The Spirit Level.*

[671] A. Day Bailey Hutchinson, 'On the rate of mortality prevailing amongst families of the peerage during the nineteenth century', *Journal of the Statistical Society*, Volume 24, 1863.

[672] S.H. Preston, M.R. Haines, *Fatal Years: Child Mortality in Late Nineteenth century America,* 1991.

[673] S.H. Preston, 'The changing relationship between mortality and level of economic development' *Population Studies*, Volume 29, 1975.

[674] M. Livi-Bacci, *Population and Nutrition: an Essay on European History*, 1991; P. Razzell, C. Spence, 'The hazards of wealth: adult mortality in pre-twentieth century Britain', *Social History of Medicine*, Volume 19, 2006.

[675] Razzell and Spence, 'The hazards'.

having poorer health).[676] Research in Sweden, Denmark, Holland and Switzerland has supported these conclusions, suggesting that the association between socio-economic status and all-cause adult mortality only emerged at the end of the nineteenth century, and that before the twentieth century 'overall, a causal link between income and mortality is put into question.'[677]

Our results provide some limited evidence to suggest that there were no major socio-economic differences in all-cause adult mortality at the end of the nineteenth century. The above conclusions are however provisional, as there is no large-scale national data at the individual family level on socio-economic status and adult mortality to reliably establish the link between socio-economic status and adult mortality. The present paper can be viewed as a first step in creating such national data and further clarifying the historical relationship between social inequality and adult mortality

[676] M. Marmot, R.G. Wilkinson, *Social Determinants of Health*, 1999.
[677] T. Bentsson, F. Van Poppel, 'Socioeconomic inequalities in death from past to present: An introduction' *Explorations in Economic History*, Volume 48, 2011.

Chapter 9: The Hazards of Wealth: Adult Mortality in Pre-Twentieth-Century England.[678]

Socio-Economic Status and Adult Mortality before the Twentieth Century

One of the most reliable studies of socio-economic status and mortality before the twentieth century is that by Hollingsworth on the aristocracy. It is possible to compare his findings with those for England and Wales, in the middle of the nineteenth century, after the introduction of civil registration.

Table 1: Expectation of Life at aged 20 amongst the Aristocracy and the Population of England and Wales (Years).[679]

Cohort Born	Males	Females
Aristocracy, 1825-49	42.0	48.3
England & Wales, 1840-41	39.2	41.7
Aristocracy, 1850-74	42.9	52.1
England & Wales 1860-61	42.7	45.7

Among men, the aristocracy had a slight advantage in life expectancy at age 20 in the first cohort, but this had disappeared by the later period, whereas female aristocrats had higher adult life expectancy in both periods.

There is data on the Royal Family which suggests that they suffered very high infant and child mortality in the sixteenth

[678] Written jointly with Christine Spence and published in the *Social History of Medicine*, Volume 19, Issue 3, 2006.

[679] For the source of this data see T.H. Hollingsworth, *The Demography of the British Peerage, Supplement to Population Studies*, Volume 18, Number 2.

and seventeenth century, with about two-thirds of children dying by the fifth birthday.[680] This was probably due to the squalid conditions of royal palaces, as well as the unhygienic practices of midwifery and the 'touching of the King's Evil' (a form of tuberculosis) which was practised by monarchs in this period.[681] Royal child mortality fell dramatically in the eighteenth and nineteenth centuries, probably associated with improvements in hygiene and midwifery, as well the practice of smallpox inoculation and vaccination.

Royal data illustrates the importance of place and the role of disease environment in shaping mortality levels.[682] This can be illustrated through research published by the Victorian actuaries Bailey and Day in 1863. They compared the life expectancy of the peerage with that in the general population of England, as well as those living in healthy districts.

Table 2: Male Life Expectancy, Mid-Nineteenth Century.[683]

Age	Peerage Families	English Life Table Dr Farr	Healthy Districts Dr Farr
20	41.46	39.99	43.40
30	35.51	33.21	36.45
40	28.33	26.46	29.29
50	21.40	19.87	22.03
60	14.56	13.6	15.06
70	8.77	8.55	9.37

[680] P. Razzell, *Population and Disease: Transforming English Society, 1550-1850*, 2007, p. 91.
[681] Ibid, pp. 149-156.
[682] For a discussion of place in shaping mortality see E. Garrett, S. Reid, S. Szreter, K. Schurer, *As Others Do Around Us: Place, Class and Demography in England and Wales, 1891*-1911, 2001; P. Razzell and C. Spence, 'Poverty or disease environment: the history of mortality in Britain, 1500-1950', in M. Breschi, L. Pozzi (eds.), *The Determinants of Infant and Child Mortality in Past European Populations*, 2004.
[683] See A. Hutcheson Bailey, A. Day, 'On the rate of mortality prevailing amongst families of the peerage during the nineteenth century', *Journal of the Statistical Society*, Volume 24, p. 69.

Life expectancy was slightly higher at all ages among the peerage than in the English population, although it was less than in those living in healthy districts. The aristocracy spent long periods living in London, in other towns and rural areas, all with different mortality risks. It is therefore important to present data, wherever possible, within geographical regions and districts, and to attempt to control for the role of place in shaping mortality levels.

The major problem with evidence on adult mortality before the advent of civil registration is the reliability of source material. Creating data through family reconstitution suffers from the problem of high migration, with only about ten per cent of reconstitution populations remaining in observation from birth to death.[684] There is also the difficulty of the unknown reliability of parish burial registers, and the problem of a variation in the reliability of data by socio-economic status, and there is no reliable evidence on the accuracy of adult burial registration by socio-economic status.

One way of addressing this problem is by analysing sources which give information on the mortality status of parents. Marriage licences and apprenticeship indentures were legally required to include information on consent of parents, in some cases by written affidavit, and where a father had died, this was usually indicated in the licence or indenture. However, the problem of self-selection means that these sources are not necessarily representative of the general population, although they do provide valuable evidence when viewed with other independent data. Marriage licences for East Kent yield data on occupation and paternal mortality for 289 parishes in the period 1619-1809. Table 3 gives the percentages of dead fathers of under-age daughters by occupational group.

[684] P. Razzell, *Mortality, Marriage and Population Growth in England, 1550-1850*, 2016, p. 43.

Table 3: Proportion of Deceased Fathers of Spinsters under 21 by Occupation of Husband in East Kent, 1619-1809 (Numbers in Cohort in Brackets).[685]

Occupation	Period		
	1619-1646	1661-1700	1751-1809
Gentlemen, Merchants, Professional	39% (205)	38% (131)	28% (159)
Yeomen, Farmers	41% 274)	42% 169)	15% (207)
Traders, Artisans	46% (491)	49% (326)	26% (397)
Husbandmen	50% (213)	39% (122)	19% (108)
Mariners, Fishermen	42% (144)	45% (103)	24% (158)

Table 3 indicates that adult mortality was slightly lower among gentlemen, merchants and professionals than in other occupational groups in the first two periods, but higher in the second half of the eighteenth century. The latter finding is confirmed by a study of marriage licences in Nottinghamshire and Sussex.

[685] P. Razzell, *Essays in English Population History*, 1994, p. 197.

Table 4: Proportion of Fathers of Spinsters and Bachelors under 21 Dead in Nottinghamshire and Sussex, 1754-1800.[686]

Occupational Group	Number Cases	Number Fathers Dead	Proportion Fathers Dead
Labourers, Servants	225	36	16%
Husbandmen	180	34	19%
Artisans, Tradesmen	582	123	21%
Farmers, Yeomen	457	76	17%
Gentlemen, Professionals	92	32	35%

Although the sample sizes are small, the pattern is similar to that revealed in Table 3, but with a higher proportion of gentlemen and professional fathers dead. The higher mortality amongst the wealthy may have been partly a function of greater ages of fathers, but the limited amount of evidence does not support this conclusion. In the absence of birth control, the average age of fathers was probably largely shaped by age of marriage, and data from Nottinghamshire suggest that this did not vary greatly between different socio-economic groups in the first half of the eighteenth century. By the late nineteenth century, men from wealthier socio-economic groups married significantly later than those from the poorer social classes.[687]

[686] For the source of data, see T.M. Blagg (ed.), *Abstracts of the Bonds and Allegations for Nottinghamshire Marriage Licences*, 1946-7; L.M. Shaw, *Nottinghamshire Marriage Bonds, 1791-1800,* 1987; D. Macleod, *Calendar of Sussex Marriage Licences*, Volumes 32 and 35, 1926 and 1929; E.W.D. Penfold (ed.), *Calendar of Sussex Marriage Licences for the Archdeaconary of Lewes, 1772-1837*, Volumes 25 and 26, 1917 and 1919.

[687] For other evidence on this topic see Razzell, 'Malthus: mortality or fertility: the history of English population in the eighteenth century'.

Table 5: Median Age of Marriage of Grooms Listed in Nottinghamshire Marriage Licences, 1701-1753 (Number of Cases in Brackets).[688]

Period	1701-20	1721-40	1741-53
Gentlemen	26 (168)	28 (118)	25 (55)
Yeomen, Farmers	26 (141)	27 (186)	25 (412)
Artisans, Tradesmen	25 (57)	25 (133)	24 (119)
Husbandmen	27 (487)	26 (695)	26 (254)
Labourers	26 (138)	27 (89)	25 (85)

There is additional evidence available on paternal mortality by socio-economic status during the early eighteenth century period. Apprenticeship indentures include information on amount of premium paid and the occupation of fathers, and there was a strong association between occupation and premium level, with gentlemen, merchants and professionals paying the highest premiums, and labourers and servants paying the lowest ones.

Table 6: Mortality amongst Fathers listed in the British Apprenticeship Register 1710-13 by Amount of Premium Paid.[689]

Premium Paid	Number of Cases	Proportion Father Dead
£1-£5	541	23%
£6-£19	587	30%
£20+	512	34%

[688] J.D. Chambers, 'The course of population change' in D.V. Glass, D.E.C. Eversley (eds.), *Population in History: Essays in Historical Demography*, 1965, p. 332.
[689] Razzell, *Mortality*, p. 51.

Table 6 indicates a positive correlation between wealth and adult mortality among apprentices' fathers. The association between wealth and mortality might be partly explained by the wealthy living more frequently in London and other unhealthy towns and cities, but as Table 7 indicates, even in an unhealthy area like London, there was a link between wealth and mortality.

Table 7: Mortality amongst London Fathers listed in the British Apprenticeship Register 1710-13 by Amount of Premium Paid.[690]

Premium Paid	Number of Cases	Proportion of Fathers Dead
£9 and Under	110	32%
£10-£19	93	41%
£20+	99	42%

Although the number of cases is small, there is still the same gradient between wealth and mortality in London as found nationally.

All the above evidence from marriage licences and apprenticeship indentures is subject to a measure of uncertainty because of the lack of exact information on the ages of fathers and the self-selected nature of the samples. More reliable data become available with the introduction of national censuses and civil registration in the nineteenth century. However, because of the way the data have been processed and interpreted, it is often itself of uncertain reliability. For example, Chadwick and others produced data to show that the wealthy lived longer than the poor, but this material was generated through a faulty methodology, using age at death as a measure of life expectancy, and not allowing for differences in the age structure of the population at risk.[691]

---

[690] Ibid, p. 52.

[691] For Chadwick's data on poverty and mortality, see M.W. Flinn (ed.), E. Chadwick, *Report on the Sanitary Condition of the Labouring Population of Great Britain, 1842*, 1965, pp. 219-27. For a critique of the methodology of

Farr produced evidence on the different registration districts of London, including information on their socio-economic characteristics and associated mortality levels.[692] He classified the mean rateable value of each district and published initial findings on two of the districts, which showed some association between wealth and mortality. He did not pursue this analysis but subsequently provided raw data for all districts which are analysed in Table 8.

Table 8: Adult (25-44) Mortality in London, 1838-44.[693]

Registration Districts	Mean Annual Value of Rated Property on Each House	Adult (25-44) Male Mortality per 1000
10 Districts with Lowest Mean Rateable Value	£15	13
10 Districts with Medium Rateable Value	£26	15
10 Districts with Highest Rateable Value	£58	13

The districts with the lowest rateable values were mostly in the East End and the wealthiest in the West End of London. Table 8 indicates that there was no significant association between the wealth of a district and its adult mortality level.

It is possible to construct reliable statistics of adult mortality for the period after 1841 in individual rural and urban parishes by using censuses and information in burial registers.

using age of death, see Registrar General, *Fifth Annual Report*, 1842, pp. 236-38.

[692] General Register Office, *Fifth Annual Report 1842*, p. 446; General Register Office, *Eighth Annual Report 1845*, pp. 192-93; General Register Office, *Ninth Annual Report (Folio Edition) 1846*, pp. 236-38.

[693] Razzell, *Mortality*, p. 40.

This involves tracking married couples in the censuses of 1841 and 1851, and linking this data with that in the parish burial registers for the intervening years. This methodology has the advantage of triangulation, allowing the comparison of information about widows and widowers in the census of 1851 with that in the burial registers. The selection of married couples allows the measurement of independent demographic events for establishing the period at risk – the listing of a spouse in a burial register, the baptism of a child, or the enumeration of the husband or wife in a later census.

To evaluate the impact of socio-economic status on adult mortality, a sample was constructed for 48 Bedfordshire parishes,[694] selecting the first married couple with elite status in the census of 1841. All professional, merchant and independent families with at least one domestic servant were selected for the elite category – there was an average of 3.2 servants per family – and they were matched with the next labourer's family of a similar age in the census schedule. The age of labourers selected was within plus or minus five years of that of elite husbands.

[694] The parishes were chosen in sequence from the Registrar-General's list of censuses of 1841 and were as follows: Ampthill, Arsley, Aspley Guise, Bedford St Cuthbert's, Bedford St John's, Bedford St Mary's, Bedford St Paul's, Biggleswade, Blunham, Clifton, Clophill, Colmsworth, Cranfield, Dunstable, Eaton Socon, Flitton, Harrold, Haynes, Henlow, Higham Gobion, Holwell, Houghton Conquest, Houghton Regis, Hunwick, Kempston, Keysoe, Langford, Leighton Buzzard, Lower Gravenhurst, Luton, Melchbourne, Northill, Pertenhall, Poddington, Potton, Turvey, Renhold, Shefford, Shelton, Southill, Stotfold, Streathley, Tilbrook, Tingrith, Toddington, Turvey, Woburn, and Wrestingworth.

Table 9: Mortality amongst Husbands and Wives Enumerated In Bedfordshire Censuses, 1841-1851

	Professional, Merchants, Gentlemen	Labourers
Number Grooms and Brides	250	250
Number Traced Cases	165	182
Number of Traced Cases Dead	26	27
Proportion Traced Cases Dead	16%	15%
Number Years at Risk	1531	1738
Average Age Traced Cases (Years)	39.8	40.7

A total of 250 married couples were included in the sample – 125 from elite families and 125 from labourers' families. Of the 250 husbands and wives in the elite category, 165 were traced (66 per cent) either in the census of 1851 or the burial register; the equivalent figure for the labourers' sample was 182 out of 250 (73 per cent). Most of the untraced cases were probably due to migration, as they involved the disappearance of both husband and wife. It is unlikely that burials of both husband and wife were not registered, given the high quality of the burial registers in these rural parishes at this time. Of 32 widows and widowers identified in the census of 1851, 30 of their spouses were located in Anglican burial registers between 1841 and 1851, indicating a high degree of burial registration reliability.

26 of 165 elite husbands and wives (16 per cent) died in the decade between 1841 and 1851, whereas the number amongst the 182 labourers' husbands and wives was 27 (15 per cent). This slightly higher mortality among elite families was in spite of a lower average age of husbands in 1841, and a shorter period at risk. Among wives, mortality was also higher in elite than in labourers' families: 13 out of 79 traced cases died (17 per cent)

as against 10 out of 83 (12 per cent). However, the sample sizes are small, and Table 9 suggests no significant difference in overall adult mortality between elite and labourers' families in Bedfordshire at this time.[695]

Reliable figures for a wider range of occupations were published by the Registrar-General at the end of the nineteenth century. There was little or no correlation between social group and adult mortality in 1860-61 and 1871, although the white-collar group had the lowest adult expectation of life in this period.[696]

Research carried out on civil registers of deaths linked to censuses for Ipswich in the period 1871-1910 indicates that there was little or no difference in adult mortality by socio-economic status in the period 1871-81, but that a social class gradient began to emerge at the end of the nineteenth century. Adult mortality was measured by tracking families in the two decades 1871-81 and 1891-1901, analysing the mortality of husbands and wives where at least one of them survived to be enumerated at the end of the decade. Elite families employing a domestic servant were compared to labourers' families, with a total of 500 husbands and wives being selected in sequence from the census at the beginning of the decade.

[695] See also P. Razzell, E. Grundy, 'Socio-economic status and adult mortality in England: a historical study, 1881-91', for further evidence of a lack of a class gradient in adult mortality in the 1880s.
[696] R. Woods, *The Demography of Victorian England and Wales*, 2000, p. 86.

Table 10 Percentage Mortality among Ipswich Elite and Labourer Husbands and Wives, in 1871-81 and 1891-1901: (Number of Cases in Brackets).[697]

Period	Elite Husbands and Wives		Labourer Husbands and Wives	
	Age Group	Mortality Rate Percentage	Age Group	Mortality Rate Percentage
1871-81	20-44	6.4% (290)	20-44	7.9% (303)
	45-69	17.5% (194)	45-69	16.9% (183)
1891-1900	20-44	6.0% (285)	20-44	8.4% (356)
	45-69	11.8% (169)	45-69	17.7% (175)

There was little or no gradient in the 1870s but by the 1890s differences in mortality – particularly for the age group 45-69 – were beginning to emerge. In order to establish the validity of this finding, it will be necessary to analyse much larger samples from the Ipswich study, and to carry out a random study of individual families in England and Wales.[698]

The aggregative statistics for England and Wales indicate that since the beginning of the twentieth century, a social class gradient in adult mortality has been progressively established, and the socio-economic adult mortality differential has widened significantly during the last few decades.[699]

The Role of Nutrition and Physical Activity

Given that elite families were much wealthier than other members of the population, and that they had access to much

[697] P. Razzell, E. Garrett, R. Davies, *The Sociological Study of Fertility and Mortality in Ipswich, 1872-1910*, 2006, online peter.razzell.co.uk.
[698] See Razzell and Grundy, 'Socio-economic status'.
[699] R.G. Wilkinson, 'Class mortality differentials, income distribution and trends in poverty 1921-82', *Journal of Social Policy*, Volume 18, 1989, p. 308; G. Davey Smith, D. Dorling, M. Shaw (eds.), *Poverty, Inequality and Health in Britain, 1800-2000: a Reader,* 2001, p.348.

better provision of food, good housing and medical care, why were their adult mortality rates the same or even higher than the rest of the population? The issue becomes even more puzzling in the light of the relatively low adult mortality among labourers and other poor groups. There is much evidence of the inadequate diet of labourers' families in the late eighteenth and early nineteenth centuries, culminating in the 'hungry forties'.[700] Chadwick and others described the insanitary quality of much of their housing, and the poverty of labourers – particularly in rural areas – has been very widely documented.[701] Recently, Bernard Harris has argued that nutrition did play a significant historical role in shaping mortality,[702] and there is some evidence that extreme poverty did significantly increase mortality in certain historical periods.[703] These findings increase the puzzle of a lack of a socio-economic gradient in adult mortality before the twentieth century.

However, there is a contemporary literature on wealth and health, which stresses the hazards of wealth rather than poverty. Thomas Tryon in 1683 wrote:

> Great drinking of *Wine* and *strong Drinks* after full Meals of *Flesh* and *Fish* … do often wound the Health … which many of the richest sort of People in this Nation might know by woeful Experience, especially in London, who do yearly spend many Hundreds, (I think I may say Thousands) of Pounds on their *Ungodly Paunches* … for their *Bellies* are swollen up to their *Chins* … their *Brains* are sunk in their *Bellies; Injection* and *Ejection* is the business of their Life, and all their precious hours are spent between the *Platter* and the *Glass*, and the *Close-stool* and *Piss-pot*.[704]

---

[700] J. Burnett, *Plenty and Want: a Social History of Diet in England from 1815 to the Present* Day, 1968.
[701] Ibid; R. Heath, *The English Peasant*, 1893; P. Razzell and R. Wainwright, *The Victorian Working* Class, 1973, pp. 4-11.
[702] B. Harris, 'Public health, nutrition, and the decline of mortality: the Mckeown thesis revisited*, Social History of* Medicine, Volume 17, 2004**.**
[703] Davey Smith, et.al., *Poverty*.
[704] T. Tyron, *The Way to Health, Long Life and Happiness*, 1683, pp. 313-14.

Tryon stressed that it was not just eating and drinking that was responsible for obesity, but also physical inactivity, which varied not just between individuals but among different socio-economic groups:

> Suppose a man were to seek *Fat Men* and *Women,* would he go into *Country-Villages* and *poor small Towns* among *Plough-men* and *Shepherds*? … No, no, such a Man's Errand would lie in *great Cities* and *Market-Towns,* where there is store of *strong Liquors* and *Idleness* … [among] People that live sedentary Lives, and are easie Imployment, more especially of mature Age, as *Gentlemen* and *Citizens*, etc, who use themselves to lie long in Bed in the Morning, and to great Dinners and rich Cordial Drinks.[705]

Tryon was mainly concerned with the effect of lifestyle on the health of the wealthy, and had little to say about the ordinary population. The Puritan clergyman Richard Baxter did give a detailed account of the lives of the rural poor at the end of the seventeenth century:

> For by the advantage of their labour and health, their browne bread and milk and butter and cheese and cabbages and turnips and parsnips and carrots and onions and potatoes and whey and buttermilk and pease pies and apple pies and puddings and pancakes and gruel and flummery and furmety, yea dry bread, and small drinke, do afford their appetites a pleasanter relish and their bodyes more strength and longer life than all the varieties and fullness of flesh and wines and strong drinkes do, to the idle gluttonous and voluptuous rich men ... The worst of the poore mans case as to health, is that they are put to goe through raine and wett, through thick and thin, through heat and cold and oft want that which nature needeth.[706]

---

[705] Ibid, pp. 320, 341.

[706] F.J. Powicke (ed.), *Richard Baxter's the Poor Husbandman's Advocate to Rich Racking Landlords*, 1926, pp. 22-26.

Baxter understood that the poor were able to enjoy relatively good health as long as they had an adequate diet of fresh vegetables, fruit, dairy and grain products, and engaged in vigorous activity through their working life. He may have exaggerated the quality of the diet of the poor, although he acknowledged that they suffered from the ill-effects of wet and cold.

An understanding of the link between diet, drink, exercise and health had become very general by the early eighteenth century. George Cheyne established his medical reputation through the publication in 1724 of his *Essay on Health and Long Life*, which ran to nine editions, and was translated into a number of different European languages. Cheyne summarised the main argument of this work by quoting Sir Charles Scarborough's advice to the Duchess of Portsmouth: 'you must eat less, or use more exercise, or take physic, or be sick'.[707]

Cheyne himself had suffered from obesity which he described in his autobiography:

> Upon my coming to London, I all of a sudden changed my whole Manner of Living; I found the Bottle Companions, the younger Gentry, and Free-Livers' to be the most easy of Access. I soon became caressed by them and grew daily in bulk and friendship with these gay gentlemen … and thus constantly dining and supping … my health was in a few years brought into great distress, by so sudden and violent a change. I grew excessively fat, short-breathed, lethargic and listless … My appetite being insatiable I sucked up and retained the juices and chyle of my food like a sponge and thereby suddenly grew plump, fat, and hale to a wonder, but … every dinner necessarily became a surfeit and a debauch, and in ten or twelve years I swelled to such an enormous size that upon my last weighing I exceeded 32 stone.[708]

---

[707] G. Cheyne, *Practical Rules for the Restoration and Preservation of Health and the Best Means for Invigorating and Prolonging Life*, 1823, p. 64.

[708] R. Porter, 'Cleaning up the Great Wen: public health in eighteenth century London', in W.F. Bynum, R. Porter (eds.), *Living and Dying in London,* 1991, pp. 325-26, 342.

Although Cheyne acknowledged that his obesity was partly a family characteristic, he understood that it was also a function of his lifestyle. The pattern of consumption of food and drink by the fashionable was partly the result of economic prosperity and the importation of luxuries:

> Since our wealth has increased and our navigation has been extended we have ransacked all the parts of the globe to bring together its whole stock of materials for riot, luxury, and to provoke excess. The tables of the rich and great (and indeed those who can afford it) are furnish'd with provisions of delicacy, number, and plenty, sufficient to provoke, and even gorge, the most large and voluptuous appetite.[709]

Cheyne summarised his general conclusions as follows:

> If any man has eat or drank so much, as render him unfit for the duties and studies of his profession … he has overdone … It is amazing to think how men of voluptuousness, laziness, and poor constitutions, should imagine themselves able to carry off loads of high-seasoned foods, and inflammatory liquors, without injury or pain; when men of mechanic employments, and robust constitutions, are scarcely able to live healthy and in vigour to any great age, on a simple, low, and almost vegetable diet.[710]

Three years after Cheyne published this work, Short wrote his *Dictionary Concerning the Causes and Effects of Corpulency*, in which he concluded that 'lean People generally enjoy a far greater Measure of Health' than those who were over-weight.[711] This theme of the damaging effects of excess and obesity became commonplace in eighteenth and nineteenth century medical writings.

---

[709] Ibid, pp. 49-50.
[710] Cheyne, *Practical*, p. 65.
[711] T. Short, *A Dictionary Concerning the Causes and Effects of Corpulency,* 1727, p.39.

One of the most popular eighteenth-century books on medicine was Buchan's *Domestic Medicine* which was first published in 1769, and was frequently reprinted in new editions through to the middle of the nineteenth century. Buchan summarised his view on activity, exercise and health as follows:

> Those whom labour obliges to labour for daily bread, are not only the most healthy, but generally the most happy … Tis now below any one to walk who can afford to be carried. How ridiculous would it seem to a person unacquainted with modern luxury … to see a fat carcase, over-run with diseases occasioned by inactivity, dragged through the streets by half a dozen horses.[712]

The ill-health of the wealthy was sometimes linked to the incidence of gout, although contemporaries had a broader conception of the disease than would be the case today.[713] The awareness of the ill-effects of over-eating does not appear to have greatly influenced the behaviour of the wealthy in the eighteenth century. Parson Woodforde detailed in his diary his dietary excesses almost on a daily basis. For example, on the 14 February 1791, he wrote, 'we had for Dinner Cod and Oyster Sauce, a fillet of Veal rosted, boiled Tongue, stewed Beef, Peas Soup and Mutton Stakes. 2nd Course, a rost Chicken, Cheesecakes, Jelly-Custards &.'[714]

Evidence of this sort is of course only anecdotal, and may not be typical of the gentry's and aristocracy's consumption of food at this time. However, there are general accounts that suggest that their food consumption may have been excessive. When La Rochefoucald visited England in 1784, he described the dining customs of country houses as follows:

---

[712] W. Buchan, *Domestic Medicine: or the Family Physician,* 1769, pp. 100-01.
[713] See for example W. Black, *An Arithmetical and Medical Analysis of the Diseases and Mortality of the Human Species,* 1973, p. 87.
[714] J. Beresford (ed.), *James Woodforde: the Diary of a Country Parson,* 1999, pp. 262-63.

> Dinner is one of the most wearisome of English experiences, lasting, as it does, for four or five hours. The first two are spent in eating and you are compelled to exercise your stomach to the full order to please your host. He asks you the whole time whether you like the food and presses you to eat more, with the result that, out of pure politeness, I do nothing but eat from the time that I sit down until the time when I get up from the table ... All the dishes consist of various meats either boiled or roasted and of joints weighing about twenty or thirty pounds.[715]

Fogel has estimated that the wealthiest tenth of the population consumed more than 4000 calories per adult per day at the end of the eighteenth century.[716] This is similar to Seebohm Rowntree's finding of 4,039 calories amongst the servant-keeping class in York at the end of the nineteenth century.[717] Commenting on the findings of a survey of the budgets of six of these families, Seebohm Rowntree concluded that:

> considering these six diets as a whole, it is clear that the amount of food consumed is in excess of requirements … it is doubtful whether the work done by the six families here considered is more than 'light industrial work', the food requirements … [for which are] 3000 calories of fuel energy.[718]

Seebohm Rowntree's sample was very small and there is little direct evidence of the effect of diet on obesity levels among the rich at this time. Information was collected on the weight of the wealthy and fashionable when they were weighed at Berry's wine merchants in St James's Street, London, and weight registers have survived from 1756 to the present day. This, of course, is a self-selected sample, and the consumption of wine is likely to have increased the incidence of obesity amongst this

[715] F. La Rochefoucald, *A Frenchman in England in 1794*, 1995, pp. 29-31.
[716] R. Fogel, 'Second thoughts on the European escape from hunger: famines, price elasticities, entitlements, chronic malnutrition and mortality rates' in S.R. Osmani (ed.), *Nutrition and Poverty*, 1992, p. 269.
[717] B. Seebohm Rowntree, *Poverty: a Study of Town Life,* 1901, p. 253.
[718] Ibid, p. 254.

wealthy group. Nevertheless, the information in the registers provides some useful background data, and was used by Francis Galton in his biometric research. He analysed the weights of 139 members of the aristocracy born between 1740 and 1829, and aged 27 to 70.[719] Many aristocrats had their weights taken several times a year, and Galton compiled charts of weight by age for each individual.

He divided his sample into three birth cohorts − 1740-69, 1770-99 and 1800-29 − and found that weight fluctuated much more significantly in the first cohort, concluding that 'there can be no doubt that the dissolute life led by the upper classes about the beginning of [the nineteenth century] … has left its mark on their age-weight traces'.[720] Although sample sizes were small, Pearson calculated mean weights for the different cohorts, and the overall average declined from 179 pounds for those born in 1740-69 to 171 pounds for those born in 1800-29.[721] The mean average of all the weights taken for the whole sample of 139 individuals is 174 pounds – 12 stone 6 pounds.

There is no information on the heights of the peerage, but there are some data on German aristocratic students aged 21 for the period 1772-96. Sixty young aristocrats had a mean average height of 168.8 cm, 6 to 7 cm less than today's equivalent.[722] Galton quoted figures of weight by age for professional men in the early 1880s, ranging from 161 pounds for 27 year-olds to 174 pounds for 60 year-olds. No heights were recorded, but there are such data on Sandhurst recruits – perhaps representative of the professional group – which indicate an average height of 68 inches for men over the age of 21 born during the middle of the

[719] F. Galton, 'The weights of British noblemen during the last three generations', *Nature,* 1884.
[720] Ibid, p. 267.
[721] Ibid.
[722] J.M. Tanner, *A History of the Study of Human Growth,* 1981, pp. 111-12.

nineteenth century.[723] This can be compared to data on the weight and height of contemporary working-class populations. For example, Liverpool convicts weighed an average of 143 pounds with a mean height of 66 inches during the mid-nineteenth century. [724] This indicated that working-class men were significantly leaner than their wealthy aristocratic and professional contemporaries.[725]

The association between wealth, dietary excesses, lack of exercise and ill-health continued to be documented into the nineteenth century.[726] The influence of these factors on longevity was summarised by Sinclair in 1833:

> It has been justly observed, that it is not the rich and great, nor those that depend on medicine, who attain old age, but such as use much exercise, breathe pure air, and where food is plain and moderate.… Hence it would appear, that the situation of the middle, and even the lower classes of society, is particularly favourable to longevity.[727]

Sinclair somewhat romanticised the condition of the poor, and perhaps a more realistic account is the following description of the life of agricultural labourers at the end of the nineteenth century:

> … wages are for labourers 8s. or 9.s. a week … In wet weather or in sickness his wages entirely cease so that he seldom makes a full week. The cottages, as a rule, are not fit to house pigs in. The

---

[723] R. Floud, K. Wachter, A. Gregory, *Height, Health and History: Nutritional Status in the United Kingdom, 1750-1980,* 1991, p.178.

[724] J.T. Danson, 'Statistical observations relative to the growth of the human body (males) in height and weight, from eighteen to thirty years of age, as illustrated by the records of the borough gaol of Liverpool' *Journal of the Statistical Society of London*, Volume 23, 1862, pp. 20-26.

[725] Most evidence points to a U-shaped relationship between body mass index and adult mortality. This suggests that both the malnourished and the over-nourished were at higher risk of mortality. See Fogel, 'Second thought', p. 24.

[726] See for example W. Wadd, *Comments on Corpulency,* 1829, p. 164; W. Banting, *Letter on Corpulence, Addressed to the Public,* 1864.

[727] J. Sinclair, *The Code of Health and Longevity*, 1833, p. 404.

> labourer breakfasts on tea-kettle broth, hot water poured on bread and flavoured with onions; dines on bread and hard cheese at 2d. a pound, with cider very washy and sour, and sups on potatoes or cabbage greased with a tiny bit of fat bacon. He seldom more than sees or smells butcher's meat. He is long lived, but in the prime of life 'crippled up', i.e. disabled by rheumatism, the result of wet clothes with no fire to dry them by for the next morning, poor living and sour cider.[728]

Other descriptions of labourers' lifestyles suggest a more generous diet, although most accounts indicate that food was often in short supply.[729] Heath noted at the end of the nineteenth century the difference in stature between the farmer and agricultural labourer: 'Compare the shapely forms of the young farmers with those of the stunted young labourer, and … compare the stalwart, jovial forms of the elderly farmers with the rheumatic, misshapen forms of the old labourers, and the evil result, not only of over-early work, but of a lifetime of poor and insufficient food and bad lodging, will be manifest.'[730] It may be that poor diet and poverty had a stronger impact on morbidity than mortality among labourers, although as we will now see, other factors may have influenced mortality levels.

The Role of Alcohol and Tobacco Consumption

Thomas Tryon summarised the changes that had taken place in the smoking of tobacco during the seventeenth century:

> It is not above sixty or seventy years ago since that only *Gentlemen*, and but a few of those took *Tobacco,* and then so moderately, that one Pipe would serve four or five, for they handed it from one to another … but now every Plow-man has his Pipe to himself.[731]

---

[728] Quoted in Burnet, *Plenty*, p. 166.
[729] Ibid.
[730] R. Heath, *The English Peasant*, 1893, p. 129.
[731] T. Tryon, *The Way to Health, Long Life and Happiness*, 1863, p. 168.

However, he acknowledged that among ordinary working families 'the Expenses which this smoking generally draws with it, have half starved their poor Families'.[732] He indicated that wealth played a role in the consumption of tobacco and other luxuries:

> Are not those that live in the most Remote parts of *England,* and far from *Cities* and *Sea-Ports*, where *Money* is scarce, and such things dear, that the common People cannot buy them, most healthful and freest from Diseases? But now these *Out-landish Ingredients* begin to be so much admired, that the *good Dame, viz the Farmers Wife* will sell her *Eggs, Butter, Cheese* and *Wheat* to buy *Sugar, Spice* and *Tobacco*.[733]

More than 60 years later, Hogarth made a similar distinction between the destructive gin-drinking of Londoners and the more healthy habits of the rural poor:

> ... go into some Country Village, where that Fiery Dragon Gin has not yet spread her Poison, and you will find their Children, though in Rags, yet of a goodly and healthful Look. Their Diet indeed is coarse, but yet it's wholesome; their Drink, though better than small Beer, answers the Ends of Nutrition better than the finest Spirituous Liquors in the World.[734]

He also drew a distinction between the habits of the wealthy and the poor in the countryside:

> The Squire, who does not keep his Cellar full of the best Liquor, is but little regarded by the Farmers and Neighbours; and if the Farmer has not a Tub of the best ready breach'd, or Brandy and other Ingredients for Punch when the 'Squire is pleas'd to honour him with his own and his Friends Company, he must never expect to be invited to the noble Sport of Hunting … And all of them are

[732] Ibid, p. 171.
[733] Ibid, p. 223.
[734] W. Hogarth, *A Dissertation on Mr Hogarth's Six Prints Lately Published, Viz Gin Law, Beer Street, and the Four Stages of Cruelty,* 1751, p. 32.

> unanimously of Opinion in one Thing, that is, that they never think they make a Friend welcome unless they make him drunk.[735]

La Rochefoucald, in his account of life in English country houses, commented on the amount of alcohol consumed during dinner:

> After the sweets … the table is covered with all sorts of wine, for even gentlemen of modest means always keep a large stock of good wine. On the middle of the table there is a small quantity of fruit, a few biscuits (to stimulate thirst) and some butter, for many English people take it at dessert … One proceeds to drink − sometimes in an alarming measure. Everyone has to drink in his turn, for the bottles make a continuous circuit of the table and the host takes note that everyone is drinking in his turn.[736]

The dangers of alcohol were well known to eighteenth-century writers and artists. One of the most vivid of Rowlandson's satires was 'Death in the Bowl', showing the skeletal figure of Death drinking with a group of obese-looking gentlemen crouched over a bowl of alcohol.[737] Another of his satires showed Death wheeling an obese man away in a wheel-barrow from a tavern, outside of which two portly gentlemen and a farmer are depicted drinking and smoking tobacco, with Death telling the dead man's wife, 'Drunk and alive, the man was thine, But dead & drunk, why – he is mine.'[738]

There is very little systematic evidence on the consumption of alcohol by different socio-economic groups, but the cost of alcohol probably constrained the amount consumed by the poor. The budgets published by Eden, Davies and others during the eighteenth and nineteenth centuries, showed that the

---

[735] Ibid, p. 6.
[736] La Rochefoucald, *A Frenchman*, pp. 29-31.
[737] A.P. Oppe, *Thomas Rowlandson: His Drawings and Water-Colours,* 1923, plate 44.
[738] W. Combe, *The English Dance of Death*, 1815, p. 97.

labouring poor bought little alcohol.[739] However, the budgets did not reveal the full story, partly because they took no account of home brewing, but also because they did not adequately measure expenditure on alcohol at taverns and public houses. Eden attempted to summarise the overall position in 1797 as follows:

> Purchased liquor is an article of expenditure particularly prevalent in the South… [although] if taxed, at any time, with drinking too much, he [the labourer] thinks it sufficient … to allege, that, excepting on a Saturday evening, or occasions of festivity, he rarely allows himself more than a pint, or at most, a pot of beer a day … This is not the case in the North; where, besides the pure limpid stream, the general drink of the labouring classes is either whey or milk, or rather milk and water; or, at best, very meagre small beer.[740]

A hundred years later, Richard Heath came to similar conclusions. He noted the prevalence of taverns and beer-shops in rural areas, but writing about the Weald of Sussex concluded:

> … it would be a good thing if … the little beer shops would be shut up, and a vast amount of misery prevented. Not that the peasant of the Weald is a drunkard. He is far too poor for that. It is only on club days, and occasionally on Saturday night, that he gives way. Habitual drinking in the country is the vice of a class in a superior social position.[741]

Seebohm Rowntree, at the end of the nineteenth century, also found a relatively small consumption of alcohol amongst the respectable poor: 'the families studied [earning under 26

---

[739] F.M. Eden, *The State of the Poor, or, an History of the Labouring Classes in England from the Conquest to the Present Period*, 1797; D. Davies, *The Case of Labourers in Husbandry*, 1796; W. Neild, 'Comparative statement of the income and expenditure of certain families of the working classes in Manchester and Dunkenfield in the years 1836 and 1841', *Journal of the Statistical Society of* London, Volume 4, 1841; B.S. Rowntree, *Poverty: A Study of Town* Life, 1901.
[740] Eden, *The State*, p. 542.
[741] Heath, *The English Peasant*, p. 187.

shillings a week] represent the steady, respectable section of the labouring classes, who spend practically nothing upon drink'.[742] However, he echoed Heath when he concluded:

> There is more drinking in Class B [the second poorest group] than in Class A [the poorest group], but this does not imply a lower moral standard. People in Class A are for the most part so absolutely destitute that they could not get much drink even if they wished. And in Class B, as we have seen … the money for drink can only be found, in the great majority of cases, by foregoing some other expenditure which is necessary for maintaining the family in a state of physical efficiency.[743]

More prosperous working-class groups did, however, consume alcohol, and Seebohm Rowntree estimated that the average expenditure on drink was six shillings a week, absorbing 'more than one-sixth of the average total family income of the working classes of York.'[744] There is plenty of evidence that alcohol was consumed in large quantities in the second half of the nineteenth century. Samuel Smiles estimated in 1875 that the working classes spent £60,000,000 on drink and tobacco.[745] As John Burnett has pointed out, 'when allowance is made for the growing number of teetotallers, it means that many families must have spent a third, and some half or more, of all their income on drink'.[746] A degree of prosperity was required for the consumption of drink, and growing real incomes of working-class families after the middle of the nineteenth century made this possible.

This was also true of tobacco consumption which increased significantly after the middle of the nineteenth century, and appears to have been influenced by changes in per capita

---

[742] Rowntree, *Poverty*., p. 237.
[743] Ibid, p. 58.
[744] Ibid, p. 143.
[745] S. Smiles, *Thrift*, 1905, p. 114.
[746] Burnett, *Plenty*, p. 199.

income during the period 1791-1938.[747] Budgets compiled by Eden, Davies, Seebohm Rowntree and others showed virtually no consumption of tobacco in respectable working-class families, similar to the pattern of alcohol consumption.[748] Tobacco cost about three pence an ounce, and where family incomes were less than ten shillings a week, it would have been impossible for the working poor to sustain a significant consumption of tobacco over extended periods.[749]

The literary evidence indicates that wealthy men smoked tobacco fairly regularly. Smoking rooms were introduced into some country houses as early as the 1720s, and by the middle of the nineteenth century 'smoking rooms had become an integral part of most gentlemen's country houses, and guests who did not appear in them for a convivial smoke or game after the ladies had retired were liable to be dragged out of bed to conform to a recognised social convention'.[750] The habits of the royal family are illuminating in this respect:

> [Queen Victoria] disliked the habit intensely … Even Prince Albert had not presumed to smoke in her presence; and at Osborne House … a special smoking room was built … The queen could always detect the smell of tobacco on documents which were sent up to her; and her Assistant Private Secretary, Frederick Ponsoby … and his colleagues took to carrying peppermints in their pockets in case a summons to the queen came at a moment when their breath was sure to offend her. [751]

---

[747] The annual per capita consumption of tobacco was as follows: 1791-1815: 1.11 pounds; 1816-40: 0.84 pounds; 1841-65: 1.06 pounds; 1866-90: 1.42 pounds; 1891-1915: 1.92 pounds; 191-38: 3.13 pounds. These patterns of consumption are similar to changes in per capita income. See B.R. Mitchell, P. Deane, *Abstract of British Historical Statistics*, 1971, pp. 343-35, 355-58.

[748] Eden, *The State*; Davies, *The Case*; Neild, 'Comparative'; Rowntree, *Poverty*.

[749] C. Hibbert, *The English: A Social* History, 1987, p. 559. See also the budgets quoted in Eden, *The State*; Davies, *The Case*; Neild, 'Comparative'; Rowntree, *Poverty*.

[750] Hibbert, *The English*, p. 554.

[751] Ibid, p. 553.

The economic capacity to consume tobacco – along with an excessive consumption of food and alcohol – undoubtedly damaged the health of the wealthy. These patterns of consumption along with a lack of physical activity may have been largely responsible for the high adult mortality of the rich, a theme which can be further explored through the work of the eminent Victorian actuary, Frederick Neison.

The Work of Francis Neison

Neison was an actuary who worked for one of the leading insurance companies, and had a life-long interest in the causes of ill-health and mortality. He was sceptical about the emphasis on sanitation and poverty by his contemporaries Farr and Chadwick, and produced a range of evidence to show the importance of personal behaviour, in particular the role of physical activity and the consumption of alcohol.[752] His starting point was evidence on socio-economic status and adult mortality:

> In the year 1843, a report was made, by a committee of actuaries, on the mortality among persons assured by seventeen of the principal assurance companies of this country, and these persons may be fairly considered to belong to the middle and upper classes of society; and at various periods since the year 1824, inquiries have been made into the mortality rate among the members of friendly societies, including the more industrious and prudential of the working and the labouring portion of the people. One important result derived from these investigations is, that … [the] information clearly proves the mortality of the middle and upper classes to be above, and that of the industrious working classes to be below, the ratio for the country generally.[753]

[752] F.G.P. Neison, *Contributions to Vital* Statistics, 1864.
[753] Ibid, p. 151.

In attempting to explain this unexpected finding, Neison pointed out the importance of the characteristics of members of friendly societies:

> Their incomes are very limited, affording but the scantiest and simplest means of support. Their habitations are of an inferior order, being of the cheapest kind, and consequently in the worst streets ... For an individual to remain a Member of a Friendly Society, it is required that he should make his weekly or monthly contribution to its funds; and although a few pence is all that is needed, it presumes on a certain amount of frugality and industrial habit, sufficient to separate him from the reckless and improvident, who are more openly exposed to the vicissitudes − poverty, distress, destitution and disease.[754]

Neison recognised that poverty did play a role in creating ill-health, but argued that this was largely a function of variations in individual behaviour. He also contrasted the frugality and temperate habits of friendly society members with that of the wealthy:

> … by tracing the various classes of society in which there exists sufficient means of subsistence, beginning with the most humble, and passing on to the middle and upper classes, that a gradual deterioration in the duration of life takes place … this condition would seem to flow directly from the luxurious and pampered style of living among the wealthier classes, whose artificial habits interfere with the nature and degree of those physical exercises which, in a simpler class of society, are accompanied with a long life.[755]

He provided statistical evidence in support of the thesis that physical activity and alcohol were the key factors in shaping adult mortality patterns. He analysed friendly society records and showed that clerks whose occupation required minimal physical

[754] Ibid, p. 38.
[755] Ibid, p. 43.

exertion had a significantly lower expectation of life at all ages than plumbers, painters, bakers and miners. Clerks at age 20 had an expectation of life of 31.8 years, plumbers and painters 36.9 years, bakers 40.0 years, and miners 40.7 years.[756]

Neison classified occupations by amount of physical activity, and whether they were employed outdoors or indoors, and summarised his findings as follows:

Table 11: Expectation of Life (Years) among Friendly Society Members.[757]

Age	Indoor Occupations with Little Exercise	Indoor Occupations with Great Exercise	Outdoor Occupations with Little Exercise	Outdoor Occupations with Great Exercise
20	41.9	42.0	37.8	43.4
30	35.1	34.5	30.1	36.6
40	27.9	27.8	23.0	29.1
50	20.5	21.2	17.3	22.0
60	14.0	15.1	11.0	15.6
70	8.6	10.4	4.6	9.3

The unhealthiest occupations were those carried out outdoors with little exercise, followed by indoor occupations with little or great exercise. The healthiest occupations were those involving great exercise but carried out outdoors. Table 11 suggests that working outside did carry some health penalties – presumably through the effects of cold and damp – but that outdoor occupations with much physical activity conferred significant health benefits.

Neison carried out a special survey of mortality among those with 'intemperate habits' through sending out questionnaires to insurance companies, asking for information on insured members from medical personnel. He found a very strong mortality gradient, with those having 'intemperate habits'

[756] Ibid, pp. 54, 55.
[757] Source: Ibid, p. 456

– presumably mainly those addicted to alcohol – having much higher levels of mortality.

Table 12: Mortality among Persons of Intemperate Habits Compared to that in England and Wales.[758]

Agee	Number Exposed to Risk	Died	Mortality Per Cent	England & Wales Mortality Per Cent	Proportion of Intemperance Mortality to that of England & Wales
16-20	74.5	1	1.342	.730	1.8
21-30	949.0	47	4.953	.974	5.1
31-40	1861.0	86	4.620	1.110	4.2
41-50	1635.5	98	5.992	1.452	4.1
51-60	966.0	62	6.418	2.254	2.9
61-70	500.5	40	7.992	4.259	1.9
71-80	110.0	20	18.182	9.097	2.0
81-90	15.0	2	20.000	19.904	1.0

There are problems with the interpretation of Table 12 – the nature of the sample, its socio-economic and geographical composition – but its findings are plausible: those who drank large quantities of alcohol – and probably smoked tobacco – suffered levels of mortality in some age groups four or five times higher than the general population.

Neison assumed that he had largely refuted the arguments of Farr, Chadwick and other sanitarians, but there is no inconsistency between the importance of disease environment on the one hand, and the role of lifestyle on the other. There is evidence for the importance of both, and the relative role of these variables will depend upon particular historical and social circumstances.[759] Additonally, the wealthy have been known to have avoided certain childhood diseases, such as plague and

[758] Ibid, p. 204.
[759] J. C. Riley, *Rising Life Expectancy: a Global History,* 2001.

smallpox,[760] and been vulnerable as adults increasing their later mortality.

Wealth and Mortality among Women

The small amount of available evidence on female adult mortality is ambiguous before the twentieth century. Tryon claimed at the end of the seventeenth century that women's health suffered because of their lifestyle:

> … there being hardly any Women in the known-World that are such great Drinkers and lovers of strong liquors as the *English* ... the too frequent drinking of *Wine* and *strong Drinks,* which … makes her lose her way … [and the] Inconveniences the Mother suffers, the Child partakes thereof, both in the time of Pregnancy (or breeding) and whilst it sucks.[761]

He claimed that wealthy women were less healthy than the poor, resulting from their physical inactivity:

> Women ought *not to lie too long in* Bed, as most of them that are of any Quality or Ability do … if they do but use any kind of Exercises, and hereby their Travail in Child-bearing is tenfold more burthensom than otherwise it would be, witness many ordinary Country People, who have nothing the trouble such times as our *fine lazy sluggabed Dames.*[762]

There is no systematic evidence on lifestyle of women in wealthy families. Certainly many of the fashionable women depicted in contemporary pictorial satires were depicted as obese and over-weight.[763] Both Pepys and Parson Woodforde describe in their

---

[760] See 'The geography of smallpox in England before vaccination: a conundrum compounded', online peter.razzell.co.uk
[761] Tryon, *The Way*, pp. 278, 283-84.
[762] Ibid, pp. 288-89.
[763] Oppe, *Thomas Rowlandson*; V. Murray, *High Society: a Social History of the Regency Period, 1788-1830*, 1998.

diaries female guests consuming very generous quantities of food and drink.[764] Woodforde also makes reference to female alcoholics of his acquaintance.[765] Dobson quotes Dr George Buxton's diary for the year 1770, in which 'he claimed to have seen many women die miserably' of alcoholism.[766]

Gronow, writing in the Regency period, described how women along with men consumed large quantities of food and alcohol during dinner parties:

> … a perpetual thirst seemed to come over people, both men and women, as soon as they had tasted their soup; as from that moment everybody was taking wine with everybody else, till the close of the dinner; and such wine that produces that class of Cordiality which frequently wanders into stupefaction. How all this eating and drinking ended was obvious, from the prevalence of gout, and the necessity of every one making the pill-box their constant bedroom companion.[767]

Irvine Loudon has presented evidence to show that maternal mortality was as high or even higher among middle-class as it was working-class mothers during the nineteenth and early twentieth centuries, and this was probably partly due to the delivery of babies by medical practitioners with inadequate obstetric practices.[768] Judith Lewis has argued that there were similar problems with the treatment of pregnant aristocratic women, although her research indicates that only about five per cent of women in peerage families died in childbirth in the period before the mid-nineteenth century, similar to estimated levels in

---

[764] R.C. Latham, W. Matthews (eds.), *The Diary of Samuel Pepys,* 11 Volume*s*, 1995; Beresford, *James Woodforde*.
[765] Beresford, *James Woodforde*, pp. 20, 99.
[766] M. Dobson, *Contours of Death and Disease in Early Modern England*, 1997, p. 246.
[767] Murray, *High Society*.
[768] I. Loudon, *Death in Childbirth: an International Study of Maternal Care and Maternal Mortality, 1800-1950*, 1992, pp. 243-46.

the general population.[769] However, there was a marked drop in maternal mortality among aristocratic women in the nineteenth century, much more rapid and significant than that which occurred amongst the general population, which may have been linked to the development of the anti-sepsis movement in the mid-nineteenth century.[770]

Conclusion

The link between socio-economic status and adult male mortality probably did not become fully established until the twentieth century.[771] Given the known association between poverty and mortality, this contradiction represents an historical puzzle which warrants further investigation. Given the provisional nature of the evidence, the central aim of the paper is not to provide definitive answers to the questions raised, but rather to stimulate a debate about the potential hazards of wealth to health and mortality in the pre-twentieth-century period. The data we present are limited in scope, both in the size of samples and the geographical areas covered, and suffer from a lack of randomness due to the self-selected nature of much of the source material. However, the data are from a number of independent sources which suggest certain provisional conclusions, providing the basis for more systematic and comprehensive research in the future.

A review of literary evidence suggests that the ownership of wealth carried its own risks. Medical authorities and other writers described in detail the hazards of wealth: the excessive consumption of food, alcohol, and tobacco, linked to physical inactivity and other lifestyle factors. The research reviewed in

---

[769] J. Lewis, ''Tis a misfortune to be a Great Ladie': Maternal mortality in the British aristocracy, 1559-1959', *Journal of British Studies*, Volume 37, 1998.
[770] Lewis, 'Tis a misfortune'; Loudon, *Death*.
[771] See P. Razzell, 'Population growth and the increase in socio-economic inequality in England, 1550-1850', online peter.razzell. co.uk

this paper suggests that lifestyle may have been primarily responsible for the high adult mortality of wealthy men.

However, there are still a number of unresolved issues and the role of nutrition and poverty in shaping adult mortality still requires further clarification. A more detailed analysis of adult mortality by occupational group would partly help achieve this aim. The method of calculating mortality by tracking married couples between censuses, used with Bedfordshire and with selected English samples, is possible for all parts of England with surviving census schedules and parish registers. [772] For example, a comparison between farmers and agricultural labourers for individual parishes would further clarify the role of poverty in determining mortality. Evidence quoted earlier in Table 4 and from late nineteenth-century national censuses indicates that there was no significant difference in mortality between these two occupational groups.[773]

We have seen earlier that the life-long poverty of labourers led to physical stunting compared to farmers. It is possible that the effects of poverty among labourers were counter-balanced by the hazards of wealth among farmers – the consumption of alcohol, tobacco and an excess of food. Both groups lived in rural areas and led physically active lives, and explanations of their mortality patterns will require further research into other aspects of lifestyle and cause of death.

The overall evidence considered in this paper provides only minimal support to Wilkinson and Marmot's thesis that social inequality per se leads to higher mortality in adults. The absence of a social-class gradient in this type of mortality before the twentieth century indicates that other factors were more significant. We have suggested that lifestyle – excessive consumption of food, alcohol and tobacco, and a lack of physical activity – was central to high adult mortality among wealthy men and women. Additionally, the avoidance of certain childhood diseases by the rich may have taken their toll in later adulthood.

[772] For the latter see Razzell and Grundy, 'Socio-economic status'.
[773] Ibid.

The data reviewed suggest that there were significant health hazards attached to the ownership of wealth, but given the provisional nature of the evidence, much further research is going to be required before the complex relationship between wealth and mortality can be fully resolved.

Chapter 10: Introduction to Mayhew's Morning Chronicle Survey.[774]

On Monday, September 24th, 1849 *The Morning Chronicle* published an account of a visit to the cholera districts of Bermondsey – the first of a series of articles on the London poor by Henry Mayhew. The area he concentrated on was Jacob's Island, one of the few districts surviving the great fire of London. The island was surrounded by a tidal ditch which had become one vast open sewer and Mayhew described a part of the area as follows:

> We then journeyed on to London-street, down which the tidal ditch continues its course. In No. 1 of this street the cholera first appeared seventeen years ago, and spread up it with fearful virulence; but this year it appeared at the opposite end, and ran down it with like severity. As we passed along the reeking banks of the sewer the sun shone upon a narrow slip of the water. In the bright light it appeared the colour of a strong green tea, and positively looked as solid as black marble in the shadow – indeed it was more like watery mud than muddy water; and yet we were assured that this was the only water that the wretched inhabitants had to drink. As we gazed in horror at it, we saw drains and sewers emptying their filthy contents into it; we saw a whole tier of doorless privies in the open road, common to men and women, built over it; we heard bucket after bucket of filth splash into it, and the limbs of the vagrant boys bathing in it seemed, by pure force of contrast, white as Parian marble. And yet, as we stood doubting the fearful statement, we saw a little child, from one of the galleries opposite, lower a tin can with a rope to fill a large bucket that stood beside her. In each of the balconies that hung over the stream the same-self tub was to be seen in which the inhabitants put the mucky liquid to stand, so that they may, after it has rested a day or two, skim the fluid from the solid particles of filth, pollution and disease. As the little

[774] Published in P. Razzell (ed.), *The Morning Chronicle Survey of Labour and the Poor: The Metropolitan Distracts*, 2007,

> thing dangled her tin cup as gently as possible into the stream, a bucket of night soil was poured down from the next gallery.[775]

The impact of the article was considerable; as a result of it for example, Charles Kingsley and the Christian Socialists pressed for sanitary reform.[776] Mayhew's great skill lay in his ability to vividly recreate scenes and events encountered – we feel as we read his account that we are there in Bermondsey, seeing what he saw, 170 years ago. Mayhew also achieved the impact that he did through pioneering what we would now call oral history – or in his words, 'the first attempt to publish the history of the people, from the lips of the people themselves.'[777]

There was nothing new of course in the concern for the conditions under which the poor lived – 'The Condition of England' question was long-standing, and had been probed and investigated, since the beginning of the century in a series of medical, poor law and other government reports. Perhaps what was new was a sharpening of the concern of the propertied classes for the stability of the social order in which they so clearly had an overwhelming vested interest; *The Morning Chronicle* in its editorial, announcing the commencement of the national survey of labour and the poor argued

> the starving or mendicant state of a large portion of the people ... if suffered to remain unremedied many years longer, will eat, like a dry rot, into the very framework of our society, and haply bring down the whole fabric with a crash.[778]

The Chartist agitation of the previous year had left its mark, and the 'dangerous classes' is a phrase which appears frequently in *The Morning Chronicle* – although Mayhew only used it to rebut

---

[775] *The Morning Chronicle,* September 24, 1849.
[776] A. Humphreys (ed.), *Voices of the Poor: Selections from Henry Mayhew's The Morning Chronicle Labour and the Poor, 1849, 1850,* 1971, p. ix.
[777] H. Mayhew, *London Labour and the London Poor,* Volume 1, 1968, p. xv.
[778] *The Morning Chronicle,* October 18, 1849.

the assumptions and fears which it concealed. A secondary concern revealed by *The Morning Chronicle* editorial was the injustice of society as it was then constituted – 'No man of feeling or reflection can look abroad without being shocked and startled by the sight of enormous wealth and unbounded luxury, placed in direct juxtaposition with the lowest extremes of indigence and privation.'[779]

But again none of this was new – the middle class public had long been aware through novels as well as government reports of the existence of the poor – what was new was that a man of great sensitivity of language and feeling, was about to embark on one of the greatest surveys of human life ever undertaken; and this 'factual' survey was to have an impact on contemporaries that no other writing on the poor had ever had. To understand how Mayhew achieved this impact is one of the aims of this introduction.

Mayhew himself claimed that he had been responsible for suggesting the national survey to *The Morning Chronicle,* but this was disputed by the newspaper in an editorial after Mayhew had broken with them.[780] Whatever the origin of the survey, Mayhew's first letter appeared in the newspaper on October 19th, 1849, and a series of eighty two letters by him continued until December 12th, 1850. Just over a third of this material was incorporated in Mayhew's later study, *London Labour and the London Poor,* but the bulk of it has never been newly published (although selections have appeared in the last few years.[781]) The survey covered many regions of England and Wales, and was divided between three types of area – the rural, manufacturing and metropolitan.

---

[779] Ibid.

[780] *The Morning Chronicle,* October 31, 1850.

[781] Humphreys, *Voices*; E.P. Thompson, Eileen Yeo, *The Unknown Mayhew,* 1971; P. Razzell, R. Wainwright (eds.), *The Victorian Working Class: Selections from the Morning Chronicle*, 1973.

Mayhew was appointed the metropolitan correspondent and he appears to have been helped by his brother Gus, as well as by Charles Knight and Henry Wood, along with assistants, stenographers and general helpers.[782] It was Mayhew's contribution that soon attracted attention and the great majority of letters to the newspaper concerned his accounts of the London poor, rather than those on the countryside or industrial areas. Not only was there great general interest, but novelists of the day were clearly influenced by what they read – Charles Kingsley incorporated some of Mayhew's work into his novel *Alton Locke* and someone of the stature of Thackeray wrote in the March 1850 issue of *Punch:*

> A clever and earnest-minded writer gets a commission from *The Morning Chronicle* newspaper, and reports upon the state of our poor in London; he goes amongst labouring people and poor of all kinds – and brings back what? A picture of human life so wonderful, so awful, so piteous and pathetic, so exciting and terrible, that readers of romances own that they never read anything like to it; and that the griefs, struggles, strange adventures here depicted, exceed anything that any of us could imagine.[783]

Mayhew achieved this effect on his readers by combining the survey side of his work with illustrations drawn from vivid individual autobiographical histories. It was this latter approach which gave his work such emotional force; people could identify for the first time with the poor, not just as depicted in a novel, but through the words of individuals whose lives were being laid out before the reader. No amount of statistical and official information on the poor could come near to Mayhew's work for emotional impact. He may have arrived at his method partly through his journalistic experience; but ironically, it was probably his literal tendering of the evidence given to him by the

[782] Thomson and Yeo, *The Unknown*, pp. 60, 61.
[783] Humphreys, *Voices*, p. ix.

people he interviewed. But also Mayhew understood the poor: there were elements in his character and experience which led him to sympathize and identify with them, as we will now see.

He was born in London in 1812 the son of a self made solicitor, and was educated at Westminster Public School. The evidence we have suggests his father was both tyrannical and unsympathetic to all his children, particularly to his sons; he also appears to have been violent with his wife. Mayhew wrote a satire on his father, suggesting that he had a particular dislike for the front of respectability that his father presented to the world.[784] Although Mayhew appears to have been a brilliant pupil, his indolence and rebelliousness led him to leave the school at an early age. He refused to be flogged by the headmaster for a minor misdemeanour and immediately left the school never to return. Similarly, after a brief period of apprenticeship in his father solicitor's business, he caused his father some embarrassment by forgetting to lodge legal papers, and fled the house not to see his father for several years.

Mayhew's brilliance, indolence and humour led him to adopt the life of a literary bohemian, writing for satirical magazines (he claimed to be one of the co-founders of Punch), newspapers, as well as his own plays, short stories and novels. Much of this writing had a radical edge which was probably linked with his reaction against the conservative respectability of his father, although his work was also characterized by some of the middle-class assumptions of the day, showing that he had not escaped the influence of his bourgeois background.[785]

One aspect of Mayhew's character which perhaps has not been sufficiently stressed in other commentaries on his work, was his interest in the natural sciences. According to

---

[784] Thomson and Yeo, *The Unknown*, p. 13.

[785] See Humphreys, *Voices*, pp. xv, xvi.

one account, he had unsuccessfully tried to persuade his father to allow him to become an experimental chemist,[786] and when he left home, he spent much of his time on such experiments – he is reputed to have nearly blown up his brother's house on one occasion![787] – and his interest in natural science clearly influenced the way he approached *The Morning Chronicle* survey. He wrote to the editor of that paper in February 1850 explaining his approach:

> I made up my mind to deal with human nature as a natural philosopher or a chemist deals with any material object; and, as a man who had devoted some little of his time to physical and metaphysical science, I must say I did most heartily rejoice that it should have been left to me to apply the laws of inductive philosophy for the first time, I believe, in the world to the abstract questions of political economy.[788]

Although this stress on science and political economy would seem a far cry from Mayhew the great originator of working class oral history, with all its moving and vivid writing, the contradiction is not as great as it might seem. Mayhew always stressed he was presenting a *factual* picture of the London poor as he found them; when in dispute with the editor of *The Morning Chronicle* about the content of some of his articles – the editor had removed some passages antipathetic to free trade – Mayhew insisted that the original report of the speech of a boot-maker be restored on the grounds that he was 'a person collecting and registering facts.'[789] His notion of natural science was essentially that it was an inductive discipline, with factual information being collected in great detail before valid

---

[786] Ibid, p. xi.
[787] Ibid.
[788] *Report of the Speech of Henry Mayhew and the Evidence Adduced at a Public Meeting ... Convened by the Committee of the Tailors of London*, 1856, p. 6
[789] Ibid.

generalizations could be reached. It was partly on these grounds that he was critical of 'the political economists of the day'; he believed that they constructed their theories without familiarising themselves with the complexities of the situations they were trying to explain.

An obvious weakness in Mayhew's method was that he did not use a strict process of random sampling in selecting informants – his work was carried out before this had been developed – but he did attempt wherever possible to avoid undue bias. This is illustrated by the dispute that arose over the reliability of his evidence on Ragged Schools. His assistant R. Knight gave the following account of the method of selecting informants in a letter to *The Morning Chronicle:*

> I was directed by your Special Correspondent to obtain for him the addresses of some of the boys and girls who attended the Ragged School in Westminster, so that he might be able to visit them at their homes. Your correspondent desired me to take the names of the first parties that came to hand, so that neither particularly good nor bad cases might be selected, but such as might be presumed to be fair average examples of the practical tendency of the school in question.[790]

Mayhew comes near here to a random sampling method, but elsewhere he was too dependent on special sources of information to be able to achieve this aim. Frequently he used key informants 'doctors, clergymen, trade union leaders' to both provide on a subject and introduce him to other informants on the area that he was interested in. The disadvantages and potential bias in this method is obvious, but in practice it seems to have been remarkably successful. All of Mayhew's key informants appear to have been intelligent and well-informed men, and were able to provide him with a range and depth of information that would have been unavailable elsewhere (this is

[790] *The Morning Chronicle*, April 25 1850.

perhaps a method that social scientists today might benefit from rediscovering). A check on the reliability and objectivity of the information given was the public nature of the survey. Errors were open to correction through the letter column of the newspaper – and that there were only one or two corrections of this kind,[791] bears testimony to the high overall accuracy of Mayhew's work.

The major theme of the survey was of course poverty, and an introduction of this kind can only touch upon some of the more important aspects of the subject as it was treated by Mayhew. One of the things which he revealed to his contemporaries was the complexity of poverty, as well as its inevitability. Anything which could destroy a family's ordinary means of livelihood – illness, old age, death or accident – could throw it into the most extreme and abject poverty. I quote at some length the following account given to Mayhew of what happened to a coalwhipper (a labourer unloading coal) after an accident:

> I was a coalwhipper. I had a wife and two children. Four months ago, coming off my day's work, my foot slipped, and I fell and broke my leg. I was taken to the hospital, and remained there ten weeks. At the time of the accident I had no money at all by me, but was in debt by the amount of ten shillings to my landlord. I had a few clothes of myself and wife. While I was in the hospital I did not receive anything from our benefit society, because I had not been able to keep up my subscription. My wife and children lived, while I was in hospital, by pawning my things, and going from door to door, to everyone she knowed, to give her a bit. The men who worked in the same gang as myself made up 4s: 6d. for me, and that, with two loaves of bread that they had from the receiving officer, was what they got while I was in the hospital; the landlord seized for the rent the few things that my wife had not pawned; and turned her and my two little children into the street – one was a boy three years old,

[791] See for example *The Morning Chronicle*, February 25, 1850, for a letter correcting errors on prices paid in the shoe trade.

and the other a baby just turned ten months. My wife went to her mother, and she kept her and my little ones for three weeks, till she could do so no longer. My mother, poor old woman, was most as bad off as we were. My mother only works on the ground out in the country at gardening. She makes about 7s. a week in summer; and in the winter she only has only 9d. a day to live upon; but she had at least a shelter for her child, and she willingly shared that with her daughter and daughter's children. She pawned all the clothes she had to keep them from starving – but at last everything was gone from the poor old woman, and then I got my brother to take my family in. My brother worked at garden work, the same as my mother in law did. He made about 15s. a week in summer; and about half that in the winter time … he had only one room, but he got in a bundle of straw for me, and we lived and slept there for seven weeks. He got credit for more than £1 of bread, and tea, and sugar for us; and now he can't pay, and the man threatens to summon him for it. After I left my brother's, I came to live in the neighbourhood of Wapping for I thought I might manage to do a day's work at coalwhipping, and I couldn't bear to live on his little earning any longer – he could scarcely keep himself then. At last I got a ship to deliver, but I was too weak to do the work, and in pulling at the ropes, my hand got sore, and festered for want of nourishment … After this I was obliged to lay up again, and that's the only job of work that I have been able to do for this last four months … I had one pennyworth of bread this morning. We altogether had half-a-quartern loaf among the four of us, but no tea nor coffee. Yesterday we had some bread, and tea, and butter, but wherever my wife got it from I don't know. I was three days, but a short time back, without a taste of food. (Here he burst out crying). I had nothing but water which passed my lips. I had merely a little at home, and that my wife and children had. I would rather starve myself than let them do so. Indeed, I've done it over and over again. I never begged – I'd die in the streets first. I never told nobody of my life. The foreman of my gang was the only one besides God that knew of my misery; and his wife came to me and brought me money and brought me food; and himself too, many a time ('I had a wife and

five children of my own to maintain, and it grieved me to my heart,' said the man who sat by, 'to see them want, and I unable to do more for them.')

Anyone tempted to dismantle the welfare state would do well to ponder this passage at some length; there is no doubt whatsoever from the voluminous evidence produced by Mayhew and the other correspondents of *The Morning Chronicle,* that this man's experience of what happened in sickness and ill-health was entirely typical. It is not only the extreme poverty of the family itself, but the poverty of their neighbours, workmates and relatives which gives the report such importance in revealing the terrible conditions under which the poor of Victorian England lived. The harshness with which the family were treated by the landlord and the relieving officer obviously added considerably to their misery; only the support of neighbours, workmates and above all relatives, enabled them to survive at all.

Mayhew makes it very clear that these cases were not merely examples of individual distress, but were characteristic of whole classes of people. Poverty of this kind was the result of structural changes in society, a theme which became Mayhew's overriding concern in his *Morning Chronicle* letters. He analysed the poverty resulting from changes in the organisation of trades, and began to generalize this into an indictment of the whole of capitalist society. Before he embarked on this analysis, he gathered together a vast amount of empirical evidence on the incidence and nature of poverty, and perhaps what was so unusual about this, was his ability to write so well about what other authors had managed to make so mundane and boring. Here is his description of the hiring of labourers in the docks:

As the foreman calls from a book the names, some men jump upon the backs of the others, so as to lift themselves high above the rest, and attract the notice of him who hires them. All are shouting. Some cry aloud his surname, some his Christian name; others call out their

> own names; to remind him that they are there. Now the appeal is made in Irish blarney, now in broken English. Indeed it is a sight to sadden the most callous, to see *thousands* of men struggling for only one day's hire, the scuffle being made the fiercer by the knowledge that hundreds out of the number assembled must be left to idle the day out in want. To look in the faces of that hungry crowd is to see a sight that must be ever remembered.[792]

He went on to detail the poverty of the dock labourers, and illustrated this in brilliant fashion through interviews with individual dockers and their families – families that lived in one squalid, unheated and virtually unfurnished room, who were frequently subject to hunger and illness, without proper clothing – children without shoes and socks – and could only find work if they were prepared to participate in the scramble described above. Many of the people seeking dock work had previously been silk weavers living and working in the Spitalfields area. The drastic decline in the prosperity in this trade was delineated by Mayhew in one of his first letters.[793]

Although silk-weaving was the most dramatic example of an occupation falling into destitution, most of the trades covered by Mayhew were subject to something of the same process. Real wages fell amongst nearly all occupational groups, and *The Morning Chronicle* survey provides an unrivalled series of economic histories of various trades from the late eighteenth century onwards. Workers in the shoe and boot making trade had suffered severely in living standards since the prosperity of the Napoleonic wars, as was revealed by one of Mayhew's informants:

> In 1812 the boot-makers received their highest wages. If an average could have been taken then of the earnings of the trade; one with another, I think it would have been about 35s. a man. The great decrease (from 35s. to 13s. 6d. a week) that has taken place is not so

[792] Ibid, October 26, 1849.
[793] Ibid, October 23, 1849.

> much owing to the decrease of wages as to the increase of hands; and the consequent decrease of work coming to each man. I know myself that my late master used to earn £2 a week on average many years back, but of late years I am sure he has not made 15s. a week.[794]

Mayhew unfortunately did not collect systematic information on changes in prices – the evidence he did publish suggests that prices only begun to fall significantly after the mid-1840s. But the qualitative evidence on living standards more than outweighs this deficiency. Here is a description of a boot-maker's earnings and style of life in the early years of the century:

> I got work in Mr. Roby's ... not long after the battle of Waterloo, in 1815, and was told by my fellow workmen that I wasn't born soon enough to see good times; but I've lived long enough to see bad ones. Though I wasn't born soon enough; as they said I could earn, and did earn £150 a year, something short of £3 a week; and that for eight years when trade became not so good ... I could then play my £1 a corner at whist. I *wouldn't* play at that time for less than 5s. I could afford a glass of wine, but was never a drinker; and for all that, I had my £100 in the Four per Cents for a long time (I lent it to a friend afterwards), and from £40 to £50 in the savings bank. Some made more than me, though I *must* work. I can't stand still. One journeyman, to my knowledge, saved £2,000. He once made 34 pairs of boots in three weeks. The bootmen then at Mr. Hoby's were all respectable men; they were like gentlemen – smoking their pipes in their frilled shirts, like gentlemen – all but the drunkards. At the trade meetings, Hoby's best men used to have one corner of the room to themselves, and were called the House of Lords. There was more than one hundred of us when I became one; and before then there were an even greater number. Mr. Hoby has paid five hundred pounds a week in wages. It was easy to save money in those days; one could hardly help it. We shall never see the like again.[795]

---

[794] Ibid, February 4, 1850.
[795] Ibid, February 7, 1850.

> Contrast this with the life-style of a boot-closer who assured me that he had dealt with his baker for fourteen or fifteen years and had never been able to get out of debt lately ... As for a coat, he said: 'Oh, God bless my soul, sir, I haven't bought one for this six or seven years, and my missus has not been able to purchase a gown for the same time; to do so out of my earnings *now* is impossible. If it wasn't for a cousin of mine that is in place, we shouldn't have a thing to our backs, and working for the best wages too ... Wages have been going down ever since 1830. Before that time my wife attended to her domestic duties only ... Since that period my wife has been obliged to work at shoe binding, and my daughter as well ... My comforts have certainly not increased in proportion with the price of provisions. In 1811 to 1815 bread was very high – I think about 1s.l0½d, the best loaf – and I can say I was much more comfortable then than at present. I had a meat dinner at that time every day, but now I'm days without seeing the sight of it. If provisions were not as cheap as they are now we should be starving outright ...'[796]

These were men who worked in the 'honourable' part of the trade -– working on the premises of their employer for fixed hours, their conditions of work regulated by agreement with their trade union. Although increasingly impoverished by the fall in wages, their situation was much better than that of people working in the 'dishonourable' sector – those who either worked for themselves as 'chamber masters' in their own homes, or were employed by them. This sector was strongly concentrated in the east end of London, whereas the more respectable part of the trade was concentrated mainly in the west end. This polarisation of the trades – with about ten per cent 'honourable' and ninety per cent 'dishonourable – was revealed by Mayhew to be common in the London trades. He summarised the markedly different life-styles of the two groups and illustrated it with reference to the tailoring trade:

---

[796] Ibid.

> The very dwellings of the people are sufficient to tell you the wide difference between the two classes. In the one you occasionally find small statues of Shakespeare beneath glass shades; in the other all is dirt and foetor. The working tailor's comfortable first floor ... at the West-end is redolent with the perfume of the small bunch of violets that stand in the tumbler over the mantel piece; the sweater's wretched garret is rank with the stench of filth and herrings. The honourable part of the trade are really intelligent artisans, while the slop workers are generally almost brutified with their incessant toil, wretched pay, miserable food, and filthy homes.[797]

The sweating system at its worst could be highly dangerous to health and life, as was revealed by someone who had worked for one:

> One sweater I worked with had four children, six men, and they, together with wife, sister-in-law, and himself lived in two rooms, the largest of which was about eight feet by ten. We worked in the smallest room and slept there as well – all six of us. There were two turn-up beds in it, and we slept three in a bed. There was no chimney, and indeed no ventilation whatever. I was near losing my life there. Almost all the men were consumptive, and I myself attended the dispensary for disease of the lungs.[798]

What had brought about the terrible mass of misery and poverty that week after week filled *The Morning Chronicle's* pages? The answer of the political economists of the day was that it was largely due to an over-rapid expansion of population, and it was this Malthusian orthodoxy that Mayhew was most concerned to dispute. He did not contest that an over-supply of labour would lead to a fall in wages and living standards, but criticised the Malthusian conclusion on empirical grounds. In his later work *London Labour and the London Poor,* he argued that there had been no excessive

[797] Ibid, December 14, 1849.
[798] Ibid, December 18, 1849.

increase in population in the first half of the nineteenth century, stating that the demand for labour as measured by various output/production series, had more than kept pace with population increase.[799]

He did not seem to realise that this contradicted his own findings about the increasing poverty of the mass of the people, although he could have saved part of his argument by stressing the re-distribution of income from poor to rich. The re-distribution would have had to have been very dramatic to account for the depth of poverty he found in his survey, and there is no evidence that it ever reached this scale. The major problem with Mayhew's argument is that he used production series for commodities such as cotton and wool, which are known to have expanded very dramatically, the textile industry being central to the industrial revolution then taking place. The standard of living and how it changed in this period has of course become a subject of extensive scholarly debate, but this does not appear to be resolvable with existing statistical data. Mayhew's own detailed qualitative evidence seems much more useful in telling us what was happening at this time, and the conclusion from his survey must be that there was a significant increase in poverty during the first half of the nineteenth century.

How are we to reconcile the above conclusion with some of the statistical series on wages which appear to contradict it? The answer lies I believe in what the boot-maker told Mayhew in the interview quoted previously – that it was not so much a fall in wage rates of existing trades that was responsible, but a significant decrease in the amount of employment available and the growth of sweated work practices outside of the recognized (and presumably the statistically measured) regular trades. Mayhew himself stated that 'in the generality of trades the calculation is that one-third of the hands are fully employed, one-third partially, and one-third unemployed throughout the

[799] H. Mayhew, *London Labour and the London Poor,* Volume 2, 1968, pp. 317-321.

year.'[800] This would seem to bring the analysis back to an over-supply of labour and an expanding population, but Mayhew had a series of detailed arguments based on his empirical findings with which to counter this thesis.

For him the surplus of labour was the result of the competitiveness of contemporary capitalist society, and he brought this out in a number of separate but related themes. He recognised that the introduction of new technology had a significant impact on the creation of labour surpluses; for example, he described in some detail the effect of steam machinery on the employment of sawyers and how it had both reduced their numbers and income. But the effect of the new technology was very limited in London as most industries were labour-intensive. What Mayhew did trace however was the impact of the industrial revolution of the textile industry in Lancashire, for some of the labour displaced found its way on to the London labour market. One man who had become destitute, gave Mayhew the following account of his life:

> I am thirty-eight he said, and have been a cotton-spinner, working at Chorlton-upon-Medlock. I can neither read nor write. When I was a young man, twenty years ago, I could earn £2 10s. clear money every week, after paying two piecers and a scavenger. Each piecer had 7s. 6d. a week – they are girls; the scavenger – a boy to clean the wheels of the cotton spinning machine had 2s. 6d. I was master of them wheels in the factory. This state of things continued until about the year 1837. I lived well and enjoyed myself, being a hearty man, noways a drunkard, working every day from half past five in the morning till half-past seven at night – long hours that time, master. I didn't care about money as long as I was decent and respectable. I had a turn for sporting at the wakes down there. In 1837 the 'self actors' (machines with steam power) had come into common use. One girl can mind three pairs – that used to be three men's work – getting 15s. for the work which gave three men £7 10s. Out of one factory 400

[800] Ibid, p. 300.

> hands were flung in one week, men and women together. We had a meeting of the union, but nothing could be done, and we were told to go and mind the three pairs, as the girls did, for 15s. a week. We wouldn't do that. Some went for soldiers, some to sea, some to Stopport (Stockport), to get work in factories where the self actors wer'nt agait.[801]

The Luddite reaction to new technology becomes completely understandable, its beneficiaries at this time being almost entirely the owners of factories and their like. The sawyers had destroyed the first mechanical mills in London (these were run by horse-power but on the same principle as the later steam mills), but had eventually succumbed to the new technology.

Mayhew realised however that technology was not the prime moving force in the early capitalist transformation of society, at least in the London area. Much more important was the 'extraction of labour-surpluses' through changes in the organisation of what Marx called the social relationships of production – in particular the development of petty capitalism in various forms. Mayhew did not of course analyse the course of events in such simple analytical terms; he gave a much more descriptive account of what he called the effects of the 'competitive system'. He analysed the increase of surplus labour under two headings: the increase in the number of labourers and the increase in the amount of labour extracted from an existing labour force. He saw six ways of increasing the number of labourers:

1. By the undue increase of apprentices. 2. By drafting into the ranks of labour those who should be other-wise engaged, as women and children. 3. By the importation of labourers from abroad. 4. By the migration of country labourers to towns, and so overcrowding the market in the cities. 5. By the depression of

[801] *The Morning Chronicle*, January 18, 1850.

other trades. 6. By the undue increase of the people themselves.[802]

Three, four and six are all direct effects of increasing population and belong if you like to the 'opposition argument'. One and two form a part of Mayhew's main argument (five is rather nebulous), although he does not spell this out. He grouped the means of increasing the amount of labour from a fixed labour force under seven headings: 1. By extra supervision when the workmen are paid by the day 2. By increasing the workman's interest in his work, as in piece work, where the payment of the operative is made proportional to the quantity of work done by him. 3. By large quantities of work given out at one time; as in 'lump-work' and 'contract work'. 4. By the domestic system of work, or giving out materials to be made up at the homes of the workpeople. 5. By the middleman system of labour. 6. By the prevalence of small master. 7. By a reduced rate of pay as forcing operatives to labour both longer and quicker, in order to make up the same amount of income.[803]

Many of these headings overlap as Mayhew himself was prepared to admit; categories two to six all have a strong element of increasing the capitalist principle into work situations, and in practice the prevalence of the contract system and in particular the growth of small masters (petty capitalists) seem to have been most important, at least in Mayhew's work. Headings one and seven concern the control that employers were able to exert over their work force, without having to go through indirect market forces The distinction between employer and employee becomes blurred of course in the case of the small master. A more appropriate distinction here would be between the rich capitalist and the poor worker who actually provided the labour, under whatever relationship of production.

---

[802] Mayhew, *London Labour*., Volume 2, p. 311.
[803] Ibid, p. 328.

That employers were able to extract enormous amounts of extra labour through direct control was brought out by Mayhew in a number of places. Perhaps the most striking example was the 'strapping system' in the carpentry and joinery trade:

> Concerning this I received the following extraordinary account from a man after his heavy day's labour; and never in all my experience have I seen so bad an instance of over-work. The poor fellow was so fatigued that he could hardly rest in his seat. As he spoke he sighed deeply and heavily, and appeared almost spirit-broken with excessive labour: – 'I work at what is called the strapping shop', he said, 'and have worked at nothing else for these many years past in London. I call 'strapping', doing as much work as a human being or a horse possibly can in a day, and that without any hanging upon the collar, but with the foreman's eyes constantly fixed upon you, from six o'clock in the morning to six o'clock at night. The shop in which I work is for all the world like a prison – the silent system is as strictly carried out there as in a model gaol. If a man was to ask any common question of his neighbour, except it was connected with his trade, he would be discharged there and then. If a journeyman makes the least mistake, he is packed off just the same. A man working in such places is almost always in fear; for the most trifling things he is thrown out of work in an instant ... I suppose since I knew the trade a man does four times the work that he did formerly ... What's worse than that, the men are everyone striving one against the other ... They are all tearing along from the first thing in the morning to the last thing at night, as hard as they can go, and when the time comes to knock off they are ready to drop, it was hours after I got home last night before I could get a wink of sleep; the soles of my feet were on fire, and my arms ached to that degree that I could hardly lift my hand to my head.'[804]

[804] *The Morning Chronicle*, July 18, 1850.

The result of this terrible exploitation of labour was that many joiners were 'quite old men and gray with spectacles on, by the time they are forty.'[805]

It is easy now to understand current trade union practices which attempt to regulate and control the amount of work to be done independently of the 'logic of production'. Trade unions were of course active during the whole of the nineteenth century and we must ask why they were unable to prevent the extreme conditions described above. This is perhaps the crucial question that Mayhew never answered in his discussion of political-economy, yet the answer to such a question is to be found in his own survey. Unions had been very active in the protection of living standards and working conditions, even when they had not achieved legal recognition. One boot-maker described the strike of 1812 which resulted in victory for the union:

> The masters, at that time, after holding out for thirteen weeks, gave way, yielding to all the demands of the men. 'The *scabs* had no chance in those days', said my informant, 'the wages men had it all their own way; they could do anything, and there were no slop shops then. Some scabs went to Mr. Roby 'occasioning' (that is asking whether he 'had occasion for another hand'), but he said to them, 'I can do nothing; go to my masters (the journeymen) in the Parr's Head, Swallow Street' (the sign of the public-house used by the men that managed the strike).[806]

The key to the success of unions this time was provided by another of Mayhew's informants:

> I believe the reduction of wages in our trade is due chiefly the supra-abundance of workmen; that is the real cause of our prices having gone down, because when men are scarce, or work is plentiful, they *will* have good wages. From the year

[805] Ibid.
[806] Ibid, February 4, 1850.

> 1798 our wages began to increase partly because the number of hands was decreased by war, and partly because the foreign orders were much greater then than now.[807]

After the Napoleonic wars labour flooded back onto the market, and with population doubling in the first half of the nineteenth century, the supply of labour greatly began to exceed its demand. This of course is a highly complex question, much debated by economists, sociologists and historians, the critical element in the debate being the balance between supply and demand for labour, and its relationship with the distribution of real resources within an early capitalist economy. Another boot-maker put this very simply when he told Mayhew:

> The cause of the trade being so over stocked with hands is, I believe, due in great measure to the increase of population. Every pair of feet there is born, certainly wants a pair of shoes; but unfortunately, as society is at present constituted, they cannot get them. The poor, you see, sir increase at a greater rate than the rich.[808]

Several of Mayhew's artisan informants showed a remarkably good grasp of basic economics, and one or two even anticipated Marx and Keynes in their understanding of the effects of under-consumption on the capitalist economy. One man believed in particular that the new technology would have disastrous effects on the economy:

> Suppose, I say, that *all* human labour is done away by it, and the working men are turned into paupers and criminals, then what I want to know is who are to be the customers of the capitalists? The capitalists themselves, we should remember, spend little or none (comparatively speaking) of the money *they* get; for, of course, it is the object of every capitalist to save all he

[807] Ibid, February 7, 1850.
[808] Ibid.

> can, and to increase the bulk of money out of which he makes his profits. The working men, however, spend *all* they receive – it's true a small amount is put into the savings bank, but that's a mere drop in the ocean; and so the working classes constitute the great proportion of the customers of the country. The lower their wages are reduced of course the less they have to spend, and when they are entirely superseded by machinery, of course they'll have nothing at all to spend, and then, I ask again, who are to be the capitalists' customers?[809]

These dire predictions did not come to full realisation in the hundred years or so after they were made, and this was partly because the industrial revolution had brought about an improvement of average living standards after the 1840s, mainly through a fall in prices. A number of informants told Mayhew how the fall in prices of bread, meat, fruit and vegetables, clothing and other goods, had improved their lot from the mid-1840s onwards, and this was due to a number of factors – new technology, railways, more efficient farming, foreign imports – and undoubtedly this development was the great turning point in the history of capitalism. There were of course many other factors that prevented the pauperisation of the working classes predicted by Marx – perhaps one of the most important being the development of specialization and the growth of the division of labour, which enabled the labour force through their unions to exploit the dependency of employers on small numbers of key workers. At the time that Mayhew wrote however, there was little evidence of this development, and the unions were weak and the mass of the population in a pauperised state.

What Mayhew failed to realise was the importance of the rate of expansion of the population for the conditions under which the struggle between capital and labour was conducted. (I assume here that population was expanding for other than economic reasons, and was primarily function of medical and

[809] Ibid, July 25, 1850.

other non-economic factors.)[810] Throughout his survey there is constant mention of a massive surplus of labour demanding work which was not there to be had.[811] This enabled employers to ruthlessly squash strikes and union activity, either by employing blackleg labour, or by sending work into non-unionized sectors and areas of the country.

What Mayhew did realise was that this surplus of labour enabled employers to extract even further surpluses through the modes of exploitation discussed above – formulated by Mayhew in the phrase, 'Over-work makes under-pay, and under pay makes over-work.'[812] A surplus of population did not operate in a vacuum, it was employed within a certain social relationship of production, and this could be crucial for the development of the economy. In the case of London during the middle of the nineteenth century, it was the growth of petty-capitalism that was crucial. This took many guises – sub-contracting, chamber-masters, sweaters, etc. – but the critical development was the exploitation of labour through a system of production which gave workers a personal but minimal interest in profitability.

A cabinet-maker gave the following explanation of why so many men became small capitalists working on their own account:

> One of the inducements ... for men to take for making up for themselves is to get a living when thrown out of work until they can hear of something better ... Another of the reasons for the men turning small masters is the little capital that it requires for them to start themselves .... Many works for themselves, because nobody else won't employ them, their work is so bad. Many weavers has took to our business of late .... Another reason for men turning little masters is because employment's more certain

[810] See P. Razzell, 'Malthus, mortality or marriage?: population change in eighteenth century England'.
[811] See for example *The Morning Chronicle*, October 26, 1849, November 16, 1849, January 11, 1850, January 15, 1850, July 11, 1850.
[812] *Report of the Speech*, p. 21.

like that way; a man can't be turned off easily, you see, when he works for himself. Again, some men prefer being small masters because they are more independent like; when they're working for themselves, they can begin working when they please, and knock off whenever they like. But the principal reason is because there ain't enough work at the regular shops to employ them all.[813]

These small masters were drawn into a system of ruthless competition and the money paid to them by the warehouses – the 'slaughterer' – became barely sufficient for subsistence. Many of the chamber-masters were sweaters, employing their wives and children and any other source of cheap labour, but none of them were real beneficiaries from the long and grinding hours of work – it was the owners of the warehouses and their customers who really gained from this system of exploitation. The major reason why so many small masters were prepared to tolerate these conditions was because there was no alternative – a surplus of labour through a rapidly-expanding population had thrown them out of regular work and into pauperized independence, which in turn helped destroy the power of the trade unions in the 'honourable' sector of the trade.

Although Mayhew failed to link population growth with the changes in the structure of the social relationships of production which he so effectively described, he provided in his survey nearly all that we would want to know to understand the development of contemporary capitalism. However, his survey went well beyond the confines of this major theme, and to the sociologist, his work provides a range of fascinating detail on other sociological subjects. One theme that constantly recurs is the growth of a culture of respectability during the nineteenth century, a subject which obviously fascinated Mayhew. There are frequent mentions in the survey of the decline in drunkenness

[813] *The Morning Chronicle*, August 22, 1850.

and brutality which characterized many English workmen of an earlier epoch; here is Mayhew's interview with a cabinet-maker on the subject of respectability:

> 'Within my recollection,' said an intelligent cabinet-maker, 'there was much drinking, among the cabinet-makers. This was fifteen years back. Now I am satisfied that at least seven eighths of all who are in society are sober and temperate men. Indeed, good masters won't have tipplers now-a-days' ... The great majority of the cabinet-makers are married men, and were described to me by the best informed parties as generally domestic men, living, whenever it was possible, near their workshops, and going home to every meal. They are not much of play-goers, a Christmas pantomime or any holiday spectacle being exceptions, especially where there is a family. 'I don't know a card-player,' said a man who had every means of knowing, 'amongst us, I think you'll find more cabinet-makers than any other trade members of mechanics' institutes and literary institutions and attendees of lectures.' Some journeymen cabinet-makers have saved money, and I found them all speak highly of the advantages they, as well as their masters, derive from their trade society.[814]

These respectable artisans were of course only a minority of the total of working people. We saw earlier how the members of the 'honourable' west end trade lived very different lives to those of the east end. The 'respectable' artisans were family men, living quiet private lives, markedly in contrast with the life of the 'rough' working class, which was violent, noisy and gregarious. Mayhew had a deeply ambivalent attitude towards respectability; on the one hand he admired the 'rational' sobriety, cleanliness and cultured life-style of his intelligent artisans, yet on the other was greatly attracted to the spontaneity and colour of his street folk: vagabonds, delinquents, labourers and other unrespectable inhabitants of London. The intelligence of the respectable artisan enabled him to take an active interest in union and political

[814] Ibid, August 1, 1850.

matters, whereas the unskilled workmen tended to passively acquiesce in the miseries of his lot:

> The transition from the artisan to the labourer is curious in many respects. In passing from the skilled operative of the West End to the unskilled workman of the Eastern quarter of London, the moral and intellectual change is so great that it seems as if we were in a new land and among another race. The artisans are sufficiently educated and thoughtful to have a sense of their importance in the state ... The unskilled labourers are a different class of people. As yet they are as un-political as footmen. Instead of entertaining violently democratic opinions, they appear to have no political opinions whatever or if they do possess any, they rather lean towards the maintenance 'of things as they are', than towards the ascendancy of the working people.[815]

Not only were the unskilled un-political, but they tended to be more addicted to violence, drunkenness and dishonesty than the rest of the population. Mayhew findings from official statistical returns of crime that the labourers of London were 'nine times as dishonest, five times as drunken, and nine times as savage, as the rest of the community.' [816]

What Mayhew most disliked about the unrespectable however was the dirt and squalor in which they lived. In discussing the importance of fish in the diet of the poor – the railway had ushered in an era of very cheap fish in London – he wrote:

> The rooms of the very neediest of our needy metropolitan population always smell of fish; most frequently of herrings. So much so, indeed, that to those, like myself, have been in the habit of visiting their dwellings the smell of herrings, even in comfortable

[815] Ibid, December 21, 1849.
[816] Ibid.

houses, savours from association, so strongly of squalor and wretchedness as to be often most oppressive.[817]

This echoes the passage quoted earlier, which contrasted the west end tailors comfortable apartment with flowers and pictures, and 'the sweater's wretched garret ... rank with the stench of filth and herrings.' Mayhew believed that the poor of the east end were 'brutified with their incessant toil, wretched pay, miserable food, and filthy homes' and in a number of places in his survey he uses strong moral language to condemn what he considered to be the vices of the unrespectable poor. Listen to the following account of the lives of pickpockets and note the mixture of moral disapproval and insightful sociological and psychological analysis:

It is a singular fact that as a body the pickpockets are generally very sparing of drink. My informant never knew any one of these young pickpockets or 'gonuffs' to be drunk, or to seem in any way anxious for drink. They are mostly libidinous, indeed universally so, and spend whatever money they can spare upon the low prostitution round about the neighbourhood ... Nor can their vicious propensities be ascribed to ignorance, for we have seen that out of 55 individuals, 40 could read and write, while four could read ... Neither can the depravity of their early associations be named as the cause of their delinquencies for we have seen that, as a class, their fathers are men well to do in the world. Indeed their errors seem to have rather a physical than either an intellectual or moral cause. They seem to be naturally of an erratic and self-willed temperament, objecting to the restraints of home, and incapable of continuous application to any one occupation whatsoever. They are essentially the idle and the vagabond; and they seem generally to attribute the commencement of their career to harsh government at home.[818]

[817] Mayhew, *London Labour and the London Poor*, Volume 1, p. 62.
[818] *The Morning Chronicle*, November 2, 1849.

Much of this account could be applied to Mayhew himself – his own reaction against parental authority, his 'erratic and self-willed temperament', and his restlessness. Although current sociological fashion is against the kind of physiological explanation of delinquency given by Mayhew, there is probably as much evidence in its favour as with rival more widely accepted theories.

The delinquents were rebels, but rebels with energy, intelligence, humour and a love of life. It is these qualities which inform some of Mayhew's best-known work, the writing on street entertainers, costermongers, tricksters and the host of other colourful characters which fill his pages. Listen to the marvellous account of one of the many tricks played on a gullible public:

> I've done *the shivering dodge* too – gone out in the cold weather half naked. One man has practised it so much that he can't get off shivering now. Shaking Jemmy went on with his shivering so long that he couldn't help it at last. He shivered like a jelly – like a calf's foot with the ague – on the hottest day in summer.[819]

And some of Mayhew's characters are so close in language to Dickens, that the reader finds himself unconsciously carried from one to the other. One of the Punch and Judy men told Mayhew:

> One of my pardners was buried by the workhouse; and even old Pike, the most noted showman as ever was, died in the workhouse. Pike and Porsini – Porsini was the first original street Punch, and Pike was his apprentice – their names is handed down to prosperity among the noblemen and footmen of the land. They both died in the workhouse, and, in course, I shall do the same. Something else *might* turn up, to be sure. We can't say what this luck of the world is. I'm obliged to strive wery hard – wery hard indeed, sir – now, to get a living,

[819] Ibid, January 31, 1850.

> and then not get it after all at times – compelled to go short often.[820]

The comic quality of the language conceals of course the real suffering of the street performers – Mayhew met a street clown on the verge of starvation; minutes afterwards transformed into an apparently happy and laughing performer[821] – but their human quality shines through their sufferings, and there is almost something moving in the quaintness of their language.

Mayhew was acutely aware of how sociological factors influenced the adoption of respectability or its opposite; he gave a great deal of space for example to the effects of the system of paying wages in public houses to men working in the coal unloading trade. For many years it had led to widespread drunkenness and brutality – many men beating their wives because of disputes over the spending of money on drink – and Mayhew summarised the effects of the system in the following passage:

> The children of the coalwhippers were almost reared in the tap-room, and a person who had great experience in the trade tells me he knew as many as 500 youths who were transported, and as many more who met with an untimely death. At one house there were forty young robust men employed about seventeen years ago, and of these are only two living at present. My informant tells me that he has frequently seen as many as 100 men at one time fighting pell-mell at King James's stairs, and the publican standing by to see fair play.[822]

Similarly amongst dockers the irregularity of work and income led to 'irregularity of habits' – drunkenness, violence and the squandering of money.[823] In the last resort, Mayhew's sympathy

---

[820] Ibid, May 16, 1850.
[821] Ibid, May 30, 1850.
[822] Ibid, December 21, 1849.
[823] Ibid, October 30, 1849.

for the poor was so great that it over-rode his own middle class prejudices. In a number of places he observed that morality was very different when viewed from the perspective of middle class comfort as against the realities of life amongst the poor:

> It is easy enough to be moral after a good dinner beside a snug sea-coal fire, and with our hearts well warmed with fine old port. It is easy enough for those that can enjoy these things daily to pay their poor-rates, rent their pew, and 'love their neighbours as themselves'; but place the self-same highly respectable people on a raft without sup or bite on the high sea, *and they would toss up who should eat their fellows* ... Morality on £5000 a year in Belgrave Square, is a very different thing to morality on slop-wages in Bethnal Green.[824]

In his speech to the tailors at a special public meeting on the 28th October, 1850, explaining his reasons for withdrawing from *The Morning Chronicle*, he passionately denounced the inequities of contemporary capitalist society, and perhaps came nearest to a socialist ethic and philosophy. He subsequently went on to write *London Labour and the London Poor,* some of which included part of his *Morning Chronicle* material. After this work, he fell into oblivion and obscurity. The poor seemed to bring out the very best of Mayhew; without them, his work sunk back into the rather pedestrian satirical plays and novels written for a middle class reading public (*The Morning Chronicle* survey was read by a wide range of social classes.)[825]

The very best of Mayhew was the material he collected on the lives of the poor, 'from the lips of the people themselves'. The range and depth of these autobiographies is so brilliant, that no amount of commentary can even come near to their quality and importance. Mayhew opened up a new history of the English people in this part of his work, as his informants had come from all parts of the country and spanned a complete age range. The reader has to read the survey itself to appreciate this part of his

[824] *Report of the Speech*, op. cit., p. 36.
[825] See for example *The Morning Chronicle*, June 13, 1850.

work. Dances and music at the harvest celebrations, vagabond life in the countryside and its pleasures and hardships, the problems of a country linen-draper, the harshness of convict life in Australia – the floggings and killings – the brutal conditions on board ship for emigrants (but not convicts – these were protected by their military escort), the meekness and deference of some of the poor, suffering the worst of all poverties, the colour prejudice experienced by an Indian street entertainer – this and a host of other subjects are covered in what we would now consider the beginnings of oral history. Mayhew died in July 1887, forgotten and unknown; he is now recognised as one of the great pioneers of sociological study, but above all, he was a man of deep sympathy and compassion for the suffering of the poor.

Chapter 11: Asian Population Growth and the Increase of Socio-Economic Inequality in Britain.[826]

Introduction.

There is historical evidence that English population growth in the eighteenth and nineteenth centuries increased socio-economic inequality by creating labour surpluses.[827] Thomas Piketty has recently analysed patterns of economic status, including a significant rise in inequality in Britain since the 1980s.[828] He has attributed these changes mainly to economic factors, but the present paper presents evidence to show that demographic changes linked to disease have had an independent influence on levels of inequality.

The period since the 1970s is one of economic globalisation, and inequality has been significantly shaped by global demographic and technological trends. As with the history of England, most world-wide population growth has resulted from reductions in mortality. In 1975, Preston concluded from a statistical analysis of available data that 'factors exogenous to a country's current level of income probably accounted for 75-90 per cent of the growth of life expectancy for the world as a whole between the 1930s and 1960s. Income growth *per se* accounts for only 10-25 per cent.'[829] More recently Easterlin has concluded that 'all of the modern improvement in life expectancy is due to advances in health technology, not to higher GDP per capita.'[830] This has occurred sometimes in very poor countries which have

---

[826] Unpublished paper.
[827] P. Razzell, *Mortality, Marriage and Population Growth, 1550-1850,* 2016, pp. 99-118.
[828] T. Piketty, *Capital in the Twenty-First Century*, 2014, pp. 316, 319, 323, 344.
[829] S.H. Preston, 'The changing relation between mortality and level of economic development', *Population Studies*, 29, 1975, pp. 231-248.
[830] R.A. Easterlin, 'Cross-sections are history', *Population and Development Review*, 38 Supplement, 2012, p. 304.

benefited from medical and other forms of aid.[831] Much of this diminished mortality occurred in Communist countries which had good educational and public health systems, but low per capita income growth.[832] This has invariably happened during periods of high fertility as a part of demographic transition,[833] leading to the creation of labour surpluses.

These labour surpluses allowed some developing countries to create highly competitive export industries because of the cheapness of their labour. However, the most important global demographic development was that which occurred in Asia.

Table 1: Life Expectancy and Population Growth in Asia, 1950-2001.[834]

Year	Life Expectancy	Year	Population
1950	41.6	1955	1,546,143,227
1973	57.5	1975	2,394,338,004
1990	65.5	1990	3,221,341,718
2001	67.1	2000	3,730,370,625

Life expectancy in Asia increased particularly rapidly in the period between 1950 and 1973, resulting in significant population growth in the decades between 1955 and 1990.

The most important economy in Asia was China. Its population grew rapidly after 1960, also fuelled largely by increasing life expectancy.

[831] J. Caldwell, 'Routes to low mortality in poor countries', *Population and Development Review*, 1986.
[832] J. Riley, *Low Income, Social Growth, and Good Health: a History of Twelve Countries,* 2007.
[833] S. Harper, *How Population Change Will Transform Our World*, 2016.
[834] World Bank Asian Data Online

Table 2: Life Expectancy and Population Growth in China, 1960-2015.[835]

Year	Life Expectancy (Years)	Population Size
1960	43.8	667,070,000
1980	66.6	981,235,000
2015	76.1	1,379,000,000

Most of the growth of China's population occurred between 1949 and 1975,[836] during a period of poverty and stagnating incomes, including the famine of 1959-61.[837] Riley has summarized the factors responsible for the decline of mortality after 1949 under three headings:

1. Communist rule opened with a crash programme of smallpox vaccination in 1949-52 ... [additionally] the Patriotic Hygiene Campaign sought to cleanse the environment by cleaning up towns and cities, managing refuse and waste in urban and rural areas, and reducing breeding and feeding opportunities for disease vectors, especially rats, snails, lice, houseflies, and mosquitoes. State authorities pushed latrine building, alerted people to the role of human faeces in disease propagation ... and in general followed a household approach to sanitation.
2. The campaign asked people to learn how to protect themselves against disease, using continuous social pressure to induce changes in individual behaviour and attitudes towards personal hygiene, environmental sanitation, and nutrition.
3. The Chinese, copying the Soviets, began a massive programme to train physicians and medical aids and to build hospitals and clinics.[838]

[835] World Bank China Data Online.
[836] M. Bergaglio, 'Population growth in China: the basic characteristics of China's demographic transition', CiteSeer Online, 2001.
[837] World Bank China Data Online
[838] Riley, *Low Income*, pp. 110, 111.

Much of the improved health was the result of the introduction of a cadre of 'barefoot doctors':

> Thousands of peasants – men and women who were mostly in their 20s and already had some general education – were selected for an intensive three-to-six month course in medical training. They were instructed in anatomy, bacteriology, diagnosing disease, acupuncture, prescribing traditional and Western medicine, birth control and maternal and infant care ... The barefoot doctors continued their farming work in the commune fields, working alongside their comrades. Their proximity also made them readily available to help those in need. They provided basic health care: first immunizations against disease such as diphtheria, whooping cough and measles, and health education. They taught hygiene and basic as hand washing before eating and after using latrines. Illnesses beyond their training the barefoot doctors referred to physicians at commune health centres ... there were an estimated 1 million barefoot doctors in China.[839]

Before these developments 'large numbers of people had died prematurely from malaria, tuberculosis, and faecal disease ... The methods of controlling them came to be understood through medical and public health research in western countries and partly through what western public health experts learned while working in Latin America, the Caribbean, and Asia.'[840]

These health improvements occurred in spite of China's real income per head only being a fraction of that in the United Kingdom, even after a period of significant growth between 1970 and 2016.

---

[839] V. Valentine, *Health for the Masses: China's 'Barefoot' Doctors*, NPR Online, 2006, p. 2.
[840] Riley, *Low Income*, p. 169.

Table 3: GNI per Capita (U.S.A. Dollars) in China and the United Kingdom, 1970 and 2016.[841]

Year	China	United Kingdom
1970	120	2,430
2016	8,260	42,390

The reduction in mortality and the growth of population resulted in a large surplus of cheap labour. The working population – aged 15-64 – between 1990 and 2017 in China increased by over 240 million, whereas the equivalent figure in Europe and the United States combined in the same period was less than 60 million.[842] This allowed China to develop a highly competitive manufacturing export industry: in 2004 its share of world manufacturing output was 8.7%, but by 2017 it had reached 26.6%,[843] gradually eroding the manufacturing industries of Britain, Europe and the United States.

As Nicholas Comfort has concluded, 'Over the decades that followed [from 1989 onwards] China, whose Communist Party had approved the opening up of the economy as far back as 1978, would embrace a rampant capitalism ... that would in turn generate an export-led boom giving it a near-stranglehold over the global economy.'[844]

The import of manufactured goods from Asia and China into the United Kingdom in 2016 is as follows:

[841] World Bank China Data Online
[842] C. Goodhart, M. Pradhan, *The Great Demographic Reversal*, 2020, p. 2.
[843] Ibid, p. 3.
[844] N. Comfort, *The Slow Death of British Industry*, 2012, p. 170.

Table 4: The Country of Origin of Imports of Selected Commodities into the United Kingdom, 2016.[845]

Imported Commodity	Asia & Oceania, Responsible for Proportion of Total Imports	China, Responsible for Proportion of Total Imports
Headgear	84.6%	71.3%
Ships & Boats	77.0%	10.6%
Toys & Games	69.1%	61.4%
Textiles	55.4%	51.9%
Footwear	53.2%	30.1%
Tools, Implements & Cutlery	40.7%	28.2%
Electrical Machinery	36.5%	23.3%
Furniture	30.9%	15.1%
Ceramics	28.0%	20.5%
Iron & Steel Products	21.4%	13.1%

The scale of exports coming from Asian countries – particularly from China – has had a major impact on Britain's economy and society. Manufacturing as a proportion of all employment in the United Kingdom fell from 22% in 1982 to 15% in 1992 and 8% in 2015.[846] In China and elsewhere, labour surpluses have been exploited for the maximisation of profit, transferring industrial production from developed to developing countries, with an increasing reliance on services in the developed world. Abhijit Banerjee and Esther Duflo have coined the phrase 'the China Shock' to describe its effect on deindustrialization in Western countries, and have summarized its impact on the areas affected in the U.S.A., Spain, Norway and Germany as follows:

[845] uktradeinfo@hmrc.gsi.gov.uk
[846] Manufacturing Statistics, 2015, Online.

> Fewer people got married, fewer had children, and of the children born, more were born out of wedlock. Young men – in particular, young white men – were less likely to graduate from college. Deaths of despair from drug and alcohol poisoning and suicides skyrocketed. These are all symptoms of a deep hopelessness once associated with African American communities in inner cities of the United States but are now replicated in white suburbs and industrial towns up and down the Eastern Seaboard and the eastern Midwest.[847]

The impact of these changes on the UK's economy has been summarized as follows:

> The UK's manufacturing sector has shrunk by two-thirds in the three decades between 1980 and 2010. Whereas a million people made cars in the UK during the 1960s, but by 2009 that number was just 180,000 ... by the 1980s the cotton industry had vanished. In 1983 there were 170 working coal mines, but by 2009, there were 4. After World War 2, manufacturing accounted for almost 40% of UK's economy. Manufacturing is now just a tenth of the UK economy ... and the service industry is now 75.8%.[848]

These changes have resulted in increases in the amount of socio-economic inequality. *The Economist* recently observed: 'When countries with lots of low-wage workers begin trading with richer economies, pay for similarly skilled workers converges. Those in poor countries grow richer while in richer countries workers get poorer.'[849] This process has a particular impact on the different regions of the wealthier countries, creating poverty in the old industrial communities but increased wealth in regions specializing in services. An example of this is to be found in

---

[847] A.V. Banerjee and E. Duflo, *Good Economics for Hard Times,* 2019, pp. 80-81, 85-86.
[848] A. Taylor, '21 Sad facts about deindustrialization of Britain' *Business Insider,* 18th November 2011.
[849] *The Economist*, 21st October 2017, p. 20.

patterns of household expenditure and property prices in different regions in England & Wales.

Table 5: Regional Gross Disposable Household Income and Property Prices in England & Wales.[850]

Region	Manufacturing as a Proportion of all Jobs, 1991	Manufacturing as a Proportion of all Jobs, 2015	Gross Disposable Annual Income Per Head, 2014 (£)	Average House Price, March 2017 (£)
West Midlands	30%	11%	15,611	180,293
East Midlands	30%	12%	16,217	176,213
Yorkshire & Humber	25%	11%	15,498	149,606
North West	25%	9%	15,776	150,250
North East	24%	9%	15,189	122,298
Wales	23%	10%	15,302	147,746
East	22%	8%	18,897	277,127
South West	19%	8%	18,144	240,222
South East	17%	6%	20,434	311,514
London	11%	2%	23,607	471,742

Although not a perfect correlation, the northern regions with the greatest historical reductions in the amount of manufacturing industry have lower household incomes and property values than elsewhere. The changing regional pattern of the social structure of England and Wales in the twentieth century has been documented by Gregory, Dorling and Southall:

> The data [on the regional proportion of Social Class V] for 1911 present an intriguing pattern: the highest values were in London and particularly the East End; almost all of Southern England had higher rates than the Midlands or the North. [The data on regional changes] ... shows areas in the rural south in particular as having improved

[850] GovUk Online, 2017.

> significantly since before the First World War, while Wales, the West Midlands, western parts of Norfolk, Nottinghamshire, Derbyshire, and southern Yorkshire, and what are now County Durham and West Cumbria have got worse. This arguably reflects major changes in the industrial bases of different areas, the northern areas losing the staple industries which employed large numbers of skilled and semi-skilled workers ... while rural southern areas were colonized by white-collar commuters. The inequality ratio for Social Class V tells a broadly similar story to our other measures of [inequality, including infant mortality].[851]

In the nineteenth century incomes were higher in the industrial regions of the north of England,[852] a pattern reversed in the twentieth century.

The impact of the process of deindustrialization has been summarized by Aditya Chakrabortty in 2011:

> Before moving to Yale and becoming a bestselling historian, Paul Kennedy grew up on Tyneside in the 50s and 60s. 'A world of great noise and much dirt,' is how he remembers it, where the chief industry was building ships and his father and uncles were boilermakers in Wallsend. Last year the academic gave a lecture that reminisced a little about those days. 'There was a deep satisfaction about making things,' he said. 'A deep satisfaction among all of those that had supplied the services, whether it was the local bankers with credit; whether it was the local design firms. When a ship was launched at [the Newcastle firm] Swan Hunter all the kids at the local school went to see the thing our fathers had put together ...Wandering around Wallsend a couple of weeks ago, I didn't spot any ships being launched, or even built. The giant yard Kennedy mentioned, Swan Hunter, shut a few years back, leaving acres of muddy wasteland that still haven't lured a buyer. You still find

---

[851] I. Gregory, D. Dorling, H. Southall, *A Century of Inequality in England and Wales using Standardized Geographical Units*, 2001, p. 307

[852] B.R. Mitchell, P. Deane, *Abstract of British Historical Statistics*, 1971, pp. 346, 347; E.H. Hunt, 'Industrialisation and regional inequality in Britain, 1760-1914' *The Journal of Economic History*, 49, 1986, pp. 935-966; M. Penn, *Manchester Fourteen Miles*, 1979, pp. xvii, xviii.

> industrial estates, of course ... The biggest unit on one estate is a dry cleaner; on another, a warehouse for loft insulation dwarfs all else. At a rare actual manufacturing firm, the director, Tom Clark, takes me out to the edge of the Tyne, centre of the industrial excitement remembered by Kennedy. 'Get past us and there's nothing actually being made for miles,' he says, and points down the still waterfront. At his firm, Pearson Engineering, Clark introduces me to a plater called Billy Day. Now 51, he began at the firm at 16. His 23-year-old son William is still out of work, despite applying to dozens of small factories. As the local industry's gone, so too have the apprenticeships and jobs. 'No wonder you get young kids hanging out doing whatever,' says Day. 'We've lost a whole generation.' You can see similar estates and hear similar tales across the country, from the north-west down to the Midlands and the old industrial parts of suburban London. But it's in the north-east, the former home of coal, steel, ships and not a lot else, that you see this unyielding decline at its most concentrated. It's a process I've come to think of as the de-industrial revolution, in which previously productive regions and classes are cast adrift.'[853]

These conditions have had political consequences, summarized by *The Economist*: 'Votes for Brexit and for Mr Trump were often cast as an expression of anger at a system that seems rigged. Unless policymakers grapple seriously with the problem of regional inequality, the fury of those voters will only increase.'[854]

These problems are unlikely to diminish in the short-run, but a part of the long-run solution will only occur if falling fertility in developing counties reduces population increases to levels found currently in the developed world. This is likely to happen according to demographic transition theory,[855] although this raises speculative issues beyond the scope of the present paper.

---

[853] *The Guardian*: 15th November, 2011.
[854] *The Economist*, October 21st, 2017, p. 24
[855] Harper, op. cit., 2016.

Gavin Weightman, *The Great Inoculator: The Untold Story of Daniel Sutton and His Medical Revolution*

Gavin Weightman, ***The Great Inoculator: The Untold Story of Daniel Sutton and His Medical Revolution***, Yale: Yale University Press, 2020. Pp. xvi + 188. $35.00. Hdbk. ISBN 978 0 300 24144 0.

Peter Razzell ✉

Social History of Medicine, Volume 34, Issue 3, August 2021, Pages 1033–1034, https://doi.org/10.1093/shm/hkaa077
Published: 10 October 2020

Issue Section: Book Reviews

In February 1796, a contributor to the *Gentleman's Magazine* wrote:

> The increase of people within the last 25 years is visible to every observer ... Inoculation is the mystic spell that has produced this wonder ... It is now 30 years since the Suttons, and others under their instructions, had practised their skill in inoculation upon half the kingdom, and had reduced the risk of death to the chance of one in 2000. Hence the great increase in people.... (p.158)

We do not have to take this exaggerated claim too seriously, but it does indicate the importance that contemporaries attached to the activities of Daniel Sutton and his family in promoting smallpox inoculation. Sutton is virtually unknown at present, having been eclipsed by Edward Jenner, but now Gavin Weightman in his new book—*The Great Inoculator: The Untold Story of Daniel Sutton and His Medical Revolution*—has set out to redress this neglect.

The book is not designed as an academic treatise, but is written in a highly readable format, with a focus on people and their role in developing inoculation. It examines all the problems and disputes that this first form of medical prophylaxis

encountered and its eventual success, but does so in such a way that it carries the reader through a highly complex subject.

Lady Mary Wortley had experienced inoculation while living in Turkey as wife of the British Ambassador and had her 3-year-old son inoculated while resident there. This was undertaken by a Greek woman with the help of the ambassador's surgeon, Dr Maitland. They took some smallpox matter from a pustule on the arm of a smallpox patient, and injected it by insertion in the skin of the young boy. The operation was a success with only mild resulting symptoms, and when Lady Mary returned to England she promoted the practice partly through having her daughter inoculated, but also through her influence with the Royal Family. They arranged for a trial with six Newgate prisoners, five of which were condemned to be hanged, but were reprieved if surviving the unknown operation. All survived, and after a further trial, Princess Caroline agreed to have her children inoculated, and as with the earlier trials it was successful.

However, Lady Mary was unhappy with the way the latter inoculations were carried out, as they involved deep incisions with a lancet, along with preparation involving bleeding and purging. In an anonymous publication, she described how the Greek nurses 'take it [the smallpox matter] in a nutshell, which holds enough to infect fifty people' and inoculate with a needle, similar to the modern practice of smallpox vaccination.

The complicated practice of inoculation practised by physicians and eminent surgeons was more dangerous than the Turkish practice and resulted in severe symptoms and sometimes death. After about 40 years of this practice, the Sutton family simplified both the technique and preparation of inoculation. The Suttons kept their technique secret in order to preserve its commercial success, but the person to realise the essence of its success was Edward Jenner, who described how the Suttons made the lightest possible incisions in their inoculations. Jenner himself had been inoculated as a boy with the severe form in about 1756, but later practised the much more mild method pioneered by Daniel Sutton. Jenner stated in his first publication that the 'common people were very rarely

inoculated for the Small Pox, till that practice was rendered general by the improved method introduced by the Suttons'.[1]

He was initially very modest in his claims for the benefits of the new vaccination: 'Should it be asked whether this investigation is a matter of mere curiosity … I should answer, that notwithstanding the happy effects of Inoculation … it not very unfrequently produces deformity of the skin, and sometimes, under the best management, proves fatal.'[2]

For 40 years, vaccination competed with inoculation, with the latter being much more popular with ordinary people than the wealthy. This was especially the case after the failure of vaccination to protect against future attacks of smallpox, requiring re-vaccination, whereas inoculation protected for a lifetime. Inoculation did on very rare occasions spread smallpox to unprotected people, which was why it was outlawed in 1840.

It did however protect the majority of the population, particularly under general inoculations covering the whole of a parish population. Gavin Weightman has provided the details of this success and is to be congratulated in publishing this during a period of great anxiety as a result of the COVID-19 infection. Inoculation was the first significant medical prophylaxis, and there are many lessons to be learnt from this example of a major medical innovation.

Footnotes

1 Peter Razzell, *The Conquest of Smallpox* (2003), 93.

2 *Ibid.*

© The Author(s) 2020. Published by Oxford University Press on behalf of the Society for the Social History of Medicine.

This article is published and distributed under the terms of the Oxford University Press, Standard Journals Publication Model (https://academic.oup.com/journals/pages/open_access/funder_policies/chorus/standard_publication_model)

Covid-19: Possible Lessons from the History of Variolation and Vaccination against Smallpox: A Brief Note.

Covid-19 and smallpox viruses have very different characteristics, but perhaps we have something to learn about immunity through the history of immunisation against smallpox.

Before the development of vaccination, there was a long history of another prophylactic measure against smallpox – variolation. It had been practised in China, Turkey and elsewhere for a number of decades, but was introduced into England as an officially recognised practice in the 1720s. It involved the taking of virus from a smallpox pustule from someone suffering from the disease and inoculating it into the arm of the patient. This invariably resulted in the eruption of a number of pustules in different parts of the body, and conferred a lifetime immunity against the disease, but in rare cases, there was the risk of a fatal outcome and the danger of spreading the disease through secondary infection.

The practitioners of variolation experimented with different methods of attenuating the severity of the operation, and eventually successfully created a mild form of inoculation resulting in a single eruption at the point of injection. Although safer than the traditional method of variolation, the practitioners carrying out these experiments rejected this radically attenuated form of the operation because they believed it would only confer a limited protection against future attacks of the disease.

Edward Jenner who had been a practitioner of variolation, developed vaccination at the end of the eighteenth century, believing it to be based on the inoculation of cowpox but this has been questioned by modern virological research. The origin of modern strains of vaccinia is unknown but Jenner's vaccination was successful in providing a safe prophylactic measure against the disease. Jenner originally believed that vaccination would provide a permanent protection against smallpox, but after a number of years some vaccinated patients were subsequently attacked by smallpox.

The contrast between the long-term consequences of variolation and vaccination were well-established, but given the limited immunity provided by vaccination, it became imperative that it be repeated in order to achieve long-term immunity.

It is likely that the difference in immunity between the two types of operation was a result of the severity of the resulting symptoms. Variolation appears to have stimulated a permanent boost to the immune systems, whereas vaccination only provided a temporary measure. It is possible that the same principle applies to any vaccination developed against Covid-19, and only a form of vaccination that can create a sufficiently robust response is likely to be successful. Likewise, a mild and asymptomatic form of the disease may only create limited immunity against further attacks of the virus.

Shakespeare's Biography: A Conundrum Resolved.

Shakespeare's early life has remained something of a conundrum despite extensive research into his background. His writing is universally recognized as the outstanding contribution to the history of literature, yet he was the son of a provincial artisan of limited literacy. His father John Shakespeare was a Stratford glover and unable to provide his son with a full education. This has led to the description of Shakespeare as 'the Stratford boor'[1], accounting for why many scholars are unable to accept that he was the author of his plays. His work has been attributed to an extensive range of people of high social and elite status, including among others, Francis Bacon, the Earl of Oxford, and Christopher Marlow.[2] More recently Lena Cowen has suggested that 'we must picture Shakespeare participating in the intellectual culture of Oxford … Shakespeare is nearly certain to have taken in lectures and sermons in college chapels.'[3] Again, this is pure speculation without any convincing evidence to support it.

The problem is that scholars are unable to accept that the son of a provincial artisan with limited education could have been the author of the plays, and most have invented classical sources to address this conundrum. As Ben Jonson argued, Shakespeare 'had little Latin and less Greek', and did not adhere to classical rules in writing his plays. However, he showed a unique understanding of vernacular language in creating both his comedies and tragedies.

There is also the conundrum of where Shakespeare went after he fathered three children in Stratford before appearing in London, which has been designated as the "lost years". Some have speculated that he spent this period on the continent of Europe or other places enabling him to acquire the sophisticated culture necessary for the writing of the plays.[4] None of these ideas have any credible evidence to support them but there is evidence in plain sight to resolve these difficulties.

According to Nicholas Rowe, Shakespeare worked for his father after he left school at an early age: 'Upon his leaving School, he seems to have given intirely into the way of Living which his Father propos'd to him … tho' he was his eldest Son, he could give him no better Education than his own Employment …'[5] What other biographers have not realized is that John Shakespeare was not just a glover but was a private trader involving participation in a highly sophisticated and metropolitan community.

Four legal cases involving John Shakespeare came to light in the Exchequer court, chronicled by D.L. Thomas and N.E. Evans in their article 'John Shakespeare in the Exchequer'. They reveal that the Stratford glover was engaged in subsidiary wool dealings and money-lending transactions, which indicated that John Shakespeare was a dealer in wool on a large scale.[6] An informer revealed that in 1572 John "Shaxspere" of "Stretford super Haven" and John Lockesley of the same place had illegally bought 200 tods (i.e. 5,600 pounds) of wool, and later that year John Shakespeare was accused of buying 100 tods of wool.[7]

---

[1] S. Schoenbaum, *Shakespeare's Lives*, 1991, p. viii.
[2] Ibid, pp. 385-451.
[3] L. C. Orlin, *The Private Life of William Shakespeare*, 2021, p. 248.
[4] Ibid, p. 441.
[5] C. Nicholl (ed), *Nicholas Rowe the Life of Shakespeare,* 2009, pp. 26, 28.
[6] D.L. Thomas and N.E. Evans, 'John Shakespeare in the Exchequer', *Shakespeare Quarterly*, 35 (1984), pp. 315-18; P. E. Razzell, *William Shakespeare: The Anatomy of an Enigma*, 1990, pp.17-18.
[7] Thomas and Evans, 'John Shakespeare; Razzell, *William Shakespeare*, p. 17, 18.

At an earlier date on the 4th November 1568 John Shakespeare alleged that he had sold John Walford twenty-one tods of wool at Stratford, and that £21 owing in cash had never been paid.[8] Nicholas Rowe's described John Shakespeare as a "considerable dealer in wool", It is likely that John Shakespeare traded wool on other occasions, which did not result in prosecutions.

John Shakespeare was prosecuted for illegal money lending, and this probably occurred elsewhere. He also traded in a variety of other products: according to Lee, 'he soon set up as a trader in all manner of agricultural produce. Corn, wool malt, meat, skins, and leather were among the commodities in which he dealt.'[9] He had dealings with people living in London, Worcestershire, Northamptonshire, Oxfordshire, Coventry, Nottingham and Stoke in Staffordshire.[10]

In a court case against the Lambert family in 1587 and 1588, John Shakespeare claimed for a missing twenty pounds he had 'totally lost and failed to acquire the whole gain, advantage and profit which he by buying and bargaining with the aforesaid twenty pounds have had and acquired, to the loss of thirty pounds.'[11] This is the credo – 'buying and bargaining' – of the middleman, a group whose activities Everitt has designated as, 'the free trading between individuals', defined as the 'type of bargaining which was mostly "free", or emancipated from official control: to dealing between individual traders and manufacturers in private.'[12]

Private trading was ubiquitous in Stratford in the late sixteenth century.[13] An example of this is to be found in a letter in 1598 from Adrian Quyney to Richard Sturley:

'Yff yow bargen with Wm Sha …or receve money therfor, brynge youre money homme that yow maye; and see howe knite stockynges be sold; ther ys gret byinge of them at Aysshome. Edward Wheat and Harrye, youre brother man, were both at Evyshome thys daye senet, and, as I harde, bewtow £20 ther in knyt hosse; wherefore I thynke yow maye doo good, yff yow can have money.'[14]

The activities of leading townsmen in private trading can be further illustrated by the example of Thomas Rogers, Bailiff of the Borough, who in 1595 was a butcher by trade, but was also engaged in extensive illegal buying and selling of corn, malt and cattle.[15] His attitude towards such trading is illustrated by his behaviour. He bought a cartload of barley in order to forestall the market, and when reproached for this, 'doth say that he will *justify it*, and he *careth not a turd for them all.*'[16]

Everitt has shown that this type of trading grew rapidly in the sixteenth century, particularly after about 1570. He studied it through the records of disputes between traders in

[8] Razzell, *William Shakespeare*, p. 19.
[9] S. Lee, *Life of Shakespeare*, 1898, C.U.P. Edition 2012, p. 4.
[10] Razzell, *William Shakespeare*, p. 20.
[11] B. Rowland Lewis, *The Shakespeare Documents,* Volume 1, 1940, p. 139.
[12] J. Chartres (ed), *Agricultural Markets and Trade, 1500-1750: Chapters from the Agrarian History of England and Wales,*1990, p. 92.
[13] For example, 120 of the leading townsmen in Stratford – including Shakespeare – illegally hoarded grain in 1598. Lewis, *The Shakespeare Documents*. p. 284.
[14] Ibid, p. 230.
[15] E. Fripp, *Master Richard Quyney*, 1924, p.104.
[16] Razzell, *William Shakespeare*, p. 141.

the Court of Chancery and Requests, which provide a detailed picture of John Shakespeare's economic and cultural world.

All transactions were conducted on a credit basis, for which legal bonds were drawn up by a lawyer or scrivener.[17] According to Everitt, because of the absence of banks, traders necessarily had to rely on their credit in the local community, and this often 'operated through a network of neighbours, friends, and relatives. Sons, fathers, brothers, cousins, wives, uncles, mothers, brother-in-law: all were drawn into the circle.'[18]

He has described the culture which grew up amongst individual traders:

In consequence of this network of kinship and acquaintance, the packmen, carriers, woolmen, and factors who engaged in the private agricultural market were not simply unconnected individuals … Much of the dealing in which travelling merchants engaged took place in farmhouses. Some took place in barns, and some in warehouses and corn-chambers. Perhaps the most characteristic meeting place of the wayfaring community, however, was the provincial inn. The Elizabethan inn has no exact counterpart in the modern world. It was the hotel, the bank, the warehouse, the exchange, the scrivener's office, and the marketplace of many of a trader.[19]

Everitt has elaborated on the role of the innkeeper in trading activities:

The Tudor and Stuart innkeeper was thus in a powerful position to influence the course of private trading. Many a publican provided cellars or outbuildings for the storage of his client's goods. Some converted their halls or parlours into private auction rooms … Agreement between prospective dealers was rarely reached without a lengthy series of "speeches" and "communications", and the company often sat far into the night before the transaction was concluded. Sometimes an unscrupulous innkeeper would allow some hapless yeoman (well plied with ale) to be "cozened of his money" by the "glozing terms … smooth words, and fair speeches" of the other party concerned … When the bargain was agreed, the local scrivener (sometimes himself one of the guests) was called upon to draw up one of the bonds, and the deed was read out to the assembled company … not infrequently one of the signatories later confessed himself unable to read it …[20]

The problem arose because of the poor educational system. 'Many marketing disputes arose through the illiteracy of one or other of the parties concerned.'[21]Many of the traders were helped by assistants, who 'undertook the writings of his order books, notes, and letters …'[22] Because of the writing involved in trading transactions, the aid of his son William would have been invaluable to the semi-literate John Shakespeare. As Lena Orlin has argued

For property transactions, wholesale operations, and other aspirational ventures, records and documents were vital. At Stratford's grammar school, William Shakespeare developed skills that were useful to an upwardly mobile family. By the time he was 10, he may have thought of himself as his father's partner.'[23]

[17] Chartres, *Agricultural Markets*, p. 93.
[18] Ibid, p. 106.
[19] Ibid, pp. 107, 108.
[20] Ibid, p. 110.
[21] Ibid, p. 115.
[22] Ibid, p. 104.
[23] L. Orlin, *The Private Life*, p. 46.

As Everitt has concluded, 'with the growth of private dealing some grounding in writing and accounting was imperative.'[24]

There is some independent evidence to support Rowe's statement about Shakespeare working with his father, and it involves the dispute about the purchase of land in Wilmcote that John Shakespeare had with his brother-in-law Edmund Lambert and his son John.[25] The following is an extract from the court proceedings relevant to the evidence of William Shakespeare's part and status in the dispute.

On the first day of March [1587] … he [Edmund Lambert] died … after whose death … [the land] descended to the aforesaid John Lambert, as son and heir of the said Edmund … the said John Shakespeare his wife Mary together with William Shakespeare their son, when claim had been made upon them, covenanted the said [land] … to said John Lambert and … delivered all writings and proofs concerning the said premises … besides that, he, the same John Shakespeare, and Mary his wife, at the same time with William Shakespeare their son, have always been ready hitherto not only for covenanting the aforesaid premises but also for delivering to the same John Lambert all writings and proofs concerning the same …'[26]

This is evidence that Shakespeare was still working with his father in 1588, helping his father who lacked full literacy. His role appears to have been mainly helping with the delivery and working on written records, invaluable assistance to his father at this time. However, this interpretation has been disputed by E.K. Chambers:

This is the only reference to Shakespeare in the litigation conducted by his parent about the property concerned … William, probably in respect of some right of inheritance, was a party to this, but the negotiation was apparently oral, and would not necessarily entail his presence at Stratford.[27]

There is little evidence that the negotiation was oral[28], and in any event, William Shakespeare's involvement appears to be concerned with references to written documents. Also importantly, both parties to the dispute referred to "heirs and assigns" when the inheritance of property was at issue, whereas William Shakespeare is mainly linked to the references to writing. Additionally, I believe Chambers has misread the nature of the dispute: John Shakespeare was not attempting to reclaim the land but was trying to extract extra money from John Lambert who had only recently inherited the property.[29] In effect, he was trying to cheat John Lambert out of £20, at a time when John Shakespeare appears to have been poverty stricken and looking for extra sources of income.[30]

---

[24] Ibid, p. 116.

[25] The dispute is highly complex, and it is discussed in detail in my book on Shakespeare. See 'The Shakespeare/Lambert dispute' in Razzell, *William Shakespeare*, pp. 35-45.

[26] Lewis, *The Shakespeare Documents*, pp. 138, 139.

[27] E.K. Chambers, *William Shakespeare*, Volume 2 (1930), p. 37.

[28] John Shakespeare claimed that John Lambert had promised at Stratford to pay £20 for additional evidence for security of title to the Wilmcote property, to be paid in instalments at the manor house of Anthony Ingram in Little Walford. There is evidence that these meetings never took place, as the legal documents reveal that John Lambert already had security of title. See 'The Shakespeare/Lambert Dispute' in Razzell, *William Shakespeare* pp.35-45.

[29] Ibid.

[30] In 1578 John Shakespeare was allowed by Stratford Corporation to pay a reduced contribution for the maintenance of the local militia. Additionally in the same year, he was exempted from contributing towards the weekly maintenance of the poor. See Lewis, *The Shakespeare Documents,* pp. 65-67. For his 'years of adversity',

Having his son helping with writing would have been invaluable to John Shakespeare. As Schoenbaum has written: 'From all the documentary evidence, John Shakespeare was not fully literate. Invariably the documents … [he] signed either with his mark or with a pictogram … The fully literate – even those who had become infirm or senile – tended to make a simple scrawl for their signatures rather than crosses.'[31]

There is evidence that William Shakespeare was very familiar with legal terminology. Fripp argued that he showed 'extraordinary knowledge, and large accurate usage, in his writings from the beginning, of legal terminology and procedure.'[32] The suggestion made by Malone – who was a barrister – that the dramatist spent some years as a lawyer's clerk, was also supported by other lawyers.[33] It is probable that Shakespeare acquired his legal knowledge working for his father in drafting legal documents in trading transactions.

Also, it makes it much more comprehensible as to how Shakespeare acquired the linguistic and cultural knowledge to write plays of such universal and general appeal. It has always puzzled historians how he acquired the knowledge to write such plays. His participation in meetings in inns in London and elsewhere on trading expeditions, with a 'lengthy series of "speeches" and "communications" far into the night, and "smooth words, and fair speeches" ', helps to resolve this conundrum. Everitt makes it clear that these traders were highly cosmopolitan: 'the wayfaring community developed an ethos of its own dissimilar to that of the settled society of town and village. Its spirit of speculation and adventure ran counter to the stable traditions of the English peasantry.'[34] This culture provided Shakespeare with both the knowledge and background necessary for his theatrical and business career.

He would also have been exposed to theatres in London and elsewhere as he travelled around the country with his father. Inns were often centres of theatrical productions[35] and he probably encountered them throughout the so-called 'lost years', preparing him for both his future work as a playwright and his career as an astute businessman.

.

see F.E. Halliday *A Shakespeare Companion,*1964, pp. 441- 42. This period of poverty culminated in 1592 when he avoided church because of a 'feare of process for debte'. This period of poverty partly explains Shakespeare's involvement in the poaching incident which probably occurred in about 1588 and may have been responsible for him leaving Stratford.

[31] Schoenbaum, *Shakespeare's Lives,* 2006, p. 292.

[32] E. Fripp, *Shakespeare: Man and Artist*, Volume 1, page 138.

[33] Schoenbaum, *Shakespeare's Lives*, p. 332.

[34] Chartes, *Agricultural Markets*, p. 111.

[35] See S. Schoenbaum, *William Shakespeare: A Compact Documentary Life*, 1978, p. 131; M. Wood, *In Search of Shakespeare*, 2005, p. 134. See the picture of the Green Dragon Inn.

Population Growth and the Development of Capitalism in Britain, 1550-1850.

Abstract.

This paper focuses on demographic determinism. It indicates how population levels in Britain were shaped by disease patterns, resulting in economic development and the growth of capitalism through the role of surplus labour. Although a historical phenomenon, it has also operated in modern times.[1]

The paper also includes new material on mortality levels in England and Ireland, and how they impacted population growth in both countries. These mortality changes were largely independent of economic factors and were mainly the result of ecological factors and changes in disease incidence. Mortality also had an impact on nuptiality and fertility through a process of demographic transition, with increasing population leading to pauperisation amongst labourers and others resulting in early marriage.

The same-name method has been used to generate new estimates of both birth and death under-registration from the sixteenth to the nineteenth centuries. This shows how parish registration was highly deficient throughout the parish registration period, contradicting assumptions of nearly perfect registration of births and deaths in the sixteenth and early seventeenth centuries.

[1] For example, the reduction of mortality in China through Mao's health programmes generated rapid population growth and the creation of labour surpluses. China used these to create manufacturing enterprises and exporting the resulting manufactured products to Europe, the States and elsewhere. See Peter Razzell 'Asian Population Growth and the Increase of Socio-Economic Inequality in Britain' available in a personal website on Google.

In 1965, H.J. Habakkuk presented a 'heroically simplified version of English economic history':

'long-term movements in prices, in income distribution … in real wages … are dominated by changes in the growth of population. Rising population: rising prices … low real incomes for the mass of the population … this might stand for a description of the thirteenth century, the sixteenth century, and the early seventeenth, and the period 1750-1815. Falling or stationary population with … higher mass incomes might be said to be characteristic of the intervening periods.'[2]

This statement represents a form of demographic determinism, which is confirmed by the evidence presented in this paper. It assumes that population growth was independent of economic development, an assumption challenged by the Cambridge Group, who argued that population increase was largely fuelled by economic development, with a growth of real wages leading to a reduction in the age of marriage and an increase in fertility.[3]

The assumption that real incomes rose during the eighteenth century is open to doubt, given that there was a marked increase in poverty amongst labourers and other impoverished groups at the end of the eighteenth century and first half of the nineteenth. Attempts have been made by economic historians to resolve different conclusions by adopting mathematical models, but these have resulted is significantly different answers.

For example, there is fundamental disagreement between Gregory Clark on the one hand, and Stephen Broadberry and colleagues on the other about long-term growth in England in the period between the fifteenth and early nineteenth century. The former concluded that there was no significant change in per capita incomes in this period, whereas Broadberry et.al. have concluded that GDP per head approximately doubled in the same period.[4] The different conclusions are the result of disagreements on estimates of population, the impact of technology, employment levels, the incomes of women and children, changing occupational structure, and the effect of enclosures on the demand for labour.

The problem is that there is no reliable national evidence to evaluate competing ideas and attempts to resolve these difficulties have led to the use of models which necessarily require a range of unreliable assumptions. As E.P. Thompson argued, the lack of reliable national evidence has bedevilled the long standard of living debate, which is unlikely to ever be resolved by econometric analysis.[5]

In his study of income and wealth inequalities, Thomas Piketty has written that

For far too long economists have sought to define themselves in terms of their supposedly scientific method. In fact, those methods rely on an immoderate use of mathematical methods … the new

[2] P.E Razzell, *Essays in Historical Sociology*, 2021, p, 222.
[3] E.A. Wrigley and R.S. Schofield, *The Population History of England and Wales*, 1981.
[4] G. Clark, The long march of history: farm wages, population, and economic growth, England, 1209-1869', *Economic History Review*, 60, 2007, pp. 97-135; S. Broadberry, B.M.D. Campbell, A. Klein, M. Overton and B Van Leewen, *British Economic Growth, 1270-1870,* 2015.
[5] E.P. Thompson, *The Making of the English Working Class*, 1963.

methods often lead to a neglect of history and the fact that historical experience remains our principle source of knowledge.[6]

One of the major problems with assessing real incomes is the prevalence of unemployment. Henry Mayhew in his study of London's poor concluded that 'in the generality of trades the calculation is that one third of the hands are fully employed, one third partially, and one third unemployed throughout the year.'[7] These levels of unemployment would make the use of statistical series of wage levels very unreliable. Given these difficulties, the most reliable evidence is that based on local and literary sources, particularly where it is possible to adopt a triangulation of data.

. . . . .

Accumulating evidence has indicated that infant, child and adult mortality fell sharply in the eighteenth century, from the middle of the century onwards. This can be illustrated with following sources of data:

Table 1: Infant and Child (1-4) Mortality (per 1000) in Eighteen English Parishes, 1600-1837.[8]

Period	*Infants at Risk*	*Children at Risk*	*Same Name Ratios*	*IMR*	*CMR*
1600-49	16543	12413	965/642	158	113
1650-99	13723	10266	959/689	151	106
1700-49	14994	10747	1241/1014	181	106
1750-99	17697	13035	1143/841	148	100
1800-39	19082	12922	758/565	104	85

Infant mortality rose in the first half of the eighteenth century before falling sharply during the latter half of that century and the first half of the nineteenth. Child mortality was relatively stable during the period 1600-1799 but fell during the beginning of the nineteenth century.

The mortality pattern was more pronounced in London during the parish register period, as depicted in the following table.

[6] T. Piketty, *Capital in the Twenty-First Century*, 2013.
[7] Razzell, *Essays*, pp. 234, 25.
[8] Peter Razzell, *Mortality, Marriage and Population Growth in England*, 2016, P.31. Half of the parishes were included in the Cambridge Group's reconstitution sample. All infant and child mortality figures are based on corrections derived from same-name methodology. See 'The measurement of the reliability of parish registration through same-name methodology', *Academia Online.*

Table 2: Infant and Child (1-4) Mortality in Sixteen London Parishes, 1539-1849.[9]

Period	*Infant at Risk*	*Children at Risk*	*Same Name Ratio*	*IMR*	*CMR*
1539-99	839	616	48/31	155	168
1600-49	1073	770	83/52	238	224
1650-99	1020	686	99/67	256	282
1700-49	704	387	68/39	409	176
1750-99	720	435	60/36	263	270
1800-49	199	102	8/4	141	118

Falling infant and early child mortality from the middle of the eighteenth century is also demonstrated in data from the London Bills of Mortality.

Table 3: Infant and Child Mortality from the London Bills of Mortality, 1728-1809.[10]

Period	*Number of Burials Under Two as a Proportion of Baptisms (%)*
1728-29	61
1730-39	60
1740-49	61
1750-59	51
1760-69	49
1770-79	45
1780-89	36
1790-99	33
1800-09	28

There was a similar pattern in seventeen Cambridge Group parishes, indicated by a study carried out matching elite families – clergymen, gentlemen, esquires, aristocrats – with the next non-elite family in the baptism register.[11]

Table 4: Estimated Infant and Child Mortality (1-4) Rates (Per 1000) Amongst Elite and Control Families in Seventeen Cambridge Group Parishes, 1600-1849.[12]

Period	*Elite Families*		*Control Families*	
	IMR	CMR	IMR	CMR
1600-49	134	120	184	117
1650-99	158	143	180	132
1700-49	177	106	223	146
1750-99	113	69	159	134

[9] Razzell, *Population*, pp. 13, 134. The relatively low infant and child mortality in the sixteenth century is confirmed by Finlay's research on London's infant mortality in the sixteenth century, with one measure as low as 55/1000. See Peter Razzell and Christine Spence, 'The history of infant, child and adult mortality in London, 1550-1850', *The London Journal*, 2007, pp. 276, 277.
[10] Razzell and Spence, 'The history of infant'.
[11] See Razzell, *Population*, pp. 132-133 for details of the research.
[12] Razzell, *Mortality*, p, 37.

There were rises and falls in infant mortality in both elite and control families, although the timing was slightly different in the two groups. Overall, child mortality was lower amongst the elite population, possibly as a result of better hygienic and child-rearing practices. There were, however, rises and a slight fall in child mortality in control families in the period between 1600-49 and 1800-49.

A similar study was carried out on 115 Bedfordshire parishes, revealing the following pattern.

Table 5: Estimated Infant and Child Mortality (1-4) Rates (Per 1000) Amongst Elite and Control Families in 115 Bedford shire Parishes, 1600-1849.[13]

Period	*Elite Families*		*Control Families*	
	IMR	CMR	IMR	CMR
1600-49	98	90	144	66
1650-99	147	99	166	164
1700-49	239	53	195	139
1750-99	136	49	185	245
1800-49	86	50	99	101

The pattern is similar to that in Table 4, with mortality rising and falling in the long period between the early seventeenth and middle of the nineteenth centuries, but with slight variations. One of the most significant findings was the much lower child mortality in elite families from the seventeenth century.

Some of the mortality shifts may have been the result of the increasing virulence of smallpox. For example, under five per cent of young children appear to have died of the disease in London during the sixteenth century, whereas by the end of the nineteenth century this increased to forty-five percent among the unvaccinated.[14] The wealthy practised inoculation and vaccination at an earlier date than the general population, possibly accounting for some of the variations in child mortality patterns.[15]

Adult mortality fell amongst all socio-economic groups, including the wealthy.[16] This suggests that wealth was not an important factor in the reduction in mortality. For example, the mean number of years lived by Members of Parliament during the period 1660-1820 was as follows:

[13] Razzell, *Population,* p. 133.
[14] See P.E. Razzell, *The Conquest of Smallpox*, 2003, pp. 169-180; P.E. Razzell, The geography of smallpox in England before vaccination: a conundrum compounded, *Academia Online*, pp. 6-8. McVail in his extensive review of the fatality of smallpox, concluded that 'natural smallpox gradually became throughout the eighteenth century, and up to the epidemic of 1870-73, a more virulent and fatal disease, its maximum fatality being on a large basis of facts 45 per cent.' See Ibid, p.169.
[15] Ibid.
[16] Razzell, *Population*, pp. 107, 116, 199, 204.

Table 6: Mean Number of Years Lived by Members of Parliament, 1660-1820 (Number of Cases in Brackets).[17]

Period of First Entry	*Age at First Entry*		
	29 Years and Under	*30-39 Years*	*40 Years Plus*
1660-1690	25.7 (429)	22.6 (458)	17.9 (633)
1691-1714	28.1 (520)	25.4 (402)	18.3 (438)
1715-1754	30.8 (541)	28.2 (422)	18.5 (347)
1755-1789	37.1 (480)	29.9 (354)	21.2 (431)
1790-1820	38.1 (571)	32.0 (432)	22.4 (572)

The data is of very hight quality with information on age and number of years lived for over ninety per cent of the sample. Members of Parliament came from all areas of the country and from urban and rural districts. They were very wealthy, yet their life expectancy in age groups under 39 years increased by ten to twelve years between 1660-90 and 1790-1820.

The reasons for the decline in mortality are complex, but improvements in hygiene and public health were probably a factor in lower mortality in the eighteenth century, although other health improvements such as inoculation against smallpox[18] and better midwifery practices probably played a part. In the nineteenth century infant mortality in poorer agricultural areas was much lower than in rich urban districts.[19] However, elite groups gained an increasing advantage in child mortality during and after the eighteenth century,[20] and this was probably the result of the health improvements mentioned above.

Overall, there appears to have been an exogenous change in disease mortality, with infant and child mortality increasing in severity in 1539-1749, before reducing after that period.[21] There was an increasing adult life expectancy amongst all socio-economic groups in the eighteenth century, regardless of ecology or wealth.[22] This supports Chambers thesis that there had been an autonomous reduction in disease incidence in the eighteenth century.[23]

Socio-economic differentials in infant and adult mortality appear to have largely emerged in the twentieth century, when the role of hygiene and infection begun to be fully understood. Wealth itself was probably not the major factor, and as T.H. Stevenson observed 'the lower mortality of the wealthier classes depends less upon wealth itself than upon culture, extending to matters of hygiene'.[24] Personal hygiene is independent of wealth and probably played a role on the reduction of mortality in the period between the seventeenth and nineteenth centuries.

. . . . .

[17] Ibid, p. 199. The data for 1691-1714 is from the unpublished essay P.E. Razzell, 'Malthus: mortality or marriage? English population growth in the eighteenth century', *Academia Online.*

[18] Given the marked increase in the virulence of smallpox between the sixteenth and nineteenth centuries, inoculation and vaccination were critical for the maintenance of population growth. See P.E. Razzell, *The Conquest of Smallpox*, 2007.

[19] See for example, Razzell, *Mortality*, pp. 41, 45, 48.

[20] Razzell, *Essays*, pp. 162, 195; Razzell, *Mortality*, p. 39.

[21] Razzell, *Mortality*, pp. 31, 32, 35, 37.

[22] Ibid, pp. 48, 53,

[23] D. Chambers, *Population, Economy and Society in Pre-Industrial England*, 1972.

[24] T.H.C. Stevenson, 'The vital statistics of wealth and poverty', *Journal of the Royal Statistical Society,* 91, 1928, pp. 209, 214.

What was the role of fertility in the demographic transition in the early modern period? Malthus argued theoretically that population had grown in the eighteenth century largely as a result of increasing fertility. However, he qualified this conclusion by noting that in England 'the more rapid increase of population, supposed to have taken place since the year 1780, has arisen more from the diminution of deaths than the increase of births.'[25] He went on to conclude that

> The gradual diminution and almost total extinction of the plagues which so frequently visited Europe, in the seventeenth and the beginning of the eighteenth centuries, produced a change [in the incidence of marriage] … in this country [England] it is not to be doubted that the proportion of marriages has become smaller since the improvement of our towns, the less frequent return of epidemics, and the adoption of habits of greater cleanliness.'[26]

This was an early form of demographic transition theory, and in order to evaluate this argument, it is necessary to examine the history of English nuptiality in the early modern period. The Cambridge Group argued that fertility had grown during the eighteenth century as a result of falling mean ages of marriage, linked to an increasing standard of living. They found a decline of about two-and-a-half years in the average age of marriage of spinsters in the eighteenth century.[27] This finding is somewhat contradicted by data from marriage licences, which indicate that average age of marriage rose by about a year in this period.[28] The marriage licence data covered a somewhat wealthier population than the general population, and there is evidence of different trajectories in marriage patterns between the two populations.[29]

According to marriage licences in Nottinghamshire and Gloucestershire during the seventeenth century the average age of spinsters marrying labourers and husbandmen was over 26 years, whereas the average for yeomen, gentlemen and professionals was between 22 and 24 years.[30] This conclusion is supported by the analysis of marriage licences for the Archdeaconry of Chichester:

Table 7: Marriage Age of Spinsters Marrying Bachelors, 1754-1769, 1770-95.[31]

Period	Labourers		Yeomen, Gentlemen & Professionals	
	Number	% Under 21	Number	% Under 21
1754-69	142	9%	142	22%
1770-99	169	25%	169	14%

In the earlier period 1754-69 labourers married much later than yeomen, gentlemen and professionals, but by 1770-99 the position was reversed, with labourers marrying much

[25] Razzell, *Essays*, p. 147.
[26] Ibid, p. 149.
[27] E. A. Wrigley, R.S. Davies, J.E. Oeppen, R.S. Schofield, *English Population from Family Reconstitution, 1580-1837*, 1997, p. 149.
[28] Razzell, *Population,* p. 64.
[29] For example, see G. Clark and N. Cummins, 'Malthus to modernity: wealth, status and fertility in England, 1500-1879', online paper.
[30] Razzell, *Essays*, pp. 174, 175.
[31] Ibid, p. 176.

earlier and the elite group much later. The latter differential was maintained throughout the nineteenth century.[32]

In addition to marriage ages, the proportion of women ever marrying declined significantly during the eighteenth century.

Table 8: Proportion of Female Deponents Single in the London Consistory Court, 1583-1817.[33]

Period	*Age Group – Proportion Single*			
	15-24	25-34	35-44	45+
1586-1611	62%	15%	1%	0%
1703-1713	72%	25%	7%	4%
1752-1783	77%	43%	14%	5%
1792-1817	76%	53%	13%	15%

There were important reductions in the frequency of marriage in all age groups during the eighteenth century, and this was also the case in Yorkshire and other areas of England. [34] These falls in the frequency of marriage are also to be found in data from burial registers. The following table summarizes information from twenty-three Bedfordshire burial registers which list the marital status of those buried.

Table 9: Proportion of Spinsters Listed in Twenty-Three Bedfordshire Burial Registers, 1695-1704 and 1795-1804.

Period	*Number of Spinsters*	*Total Known Cases*	*Proportion of Spinsters*
1695-1704	26	817	3%
1795-1804	90	853	11%

There was an increase of eight per cent in the number of spinsters in the period between the ends of the seventeenth and eighteenth centuries, confirming the trend of diminishing marital frequency.

The Cambridge Group's raw data indicated that it was a fall in mortality that was more important than a rise of fertility in population growth.[35] According to same name research, defective birth registration was very high in the sixteenth and seventeenth centuries before improving in the first half of the eighteenth. However, there is now evidence that birth registration deteriorated in the latter half of the eighteenth century.

[32] Ibid,
[33] Ibid, p. 67.
[34] Ibid, pp. 60-70. Szreter and Garrett have argued that there was a decline in the frequency of marriage from the middle of the eighteenth century onwards. S. Szreter and E. Garrett, 'Reproduction, compositional demography, and economic growth: family planning in England before the fertility decline', *Population and Development Review,* 2000, p. 67.
[35]Razzell, *Population*, p. 47.

Table 10: Estimated Under-Registration of Births and Deaths in England, 1538-1837.[36]

Period	*Proportion of Births Not Registered (%)*	*Proportion of Deaths Not Registered (%)*
1538-1599	39	34
1600-1649	36	31
1650-1699	30	27
1700-1749	21	22
1750-1799	32	27
1800-1837	30	23

The figures in Table 10 significantly vary from the Cambridge Group's estimates of under-registration, particularly in the sixteen and seventeenth centuries. However, they do reveal that birth registration deteriorated in the second half of the eighteenth century, assumed by the Cambridge Group. Applying the figures in Table 10 to the Group's estimates of baptism and burial rates,[37] yields the following data for the eighteenth and early nineteenth centuries.

Table 11: Estimated Birth and Death Rates in England, 1701-1820.

Period	*Estimated Birth Rate Per 1000*	*Estimated Death Rate Per 1000*
1701-1740	35.5	34.6
1741-1780	39.3	31.4
1781-1820	38.8	24.7

Table 11 reveals an increase in the birth rate of the order of three years, whereas the death rates fell by about ten years. The age structure of the English population appears not to have significantly changed between the early eighteenth and nineteenth centuries,[38] suggesting that the rise in fertility played a relatively minor role in population growth compared to the reduction of mortality.

• • • • •

John Lovell made the following argument about the importance of Ireland's economic and demographic history:

'if population growth was caused by factors independent of the economy … then it becomes possible to regard the industrialization process as one that was vitally necessary for the welfare of the mass of the population, for if there had been no rapid expansion of economic activity … then the growth of numbers would ultimately have produced a crisis of subsistence. Such a crisis of subsistence did in

[36] For death under-registration see Razzell, *Population*, p. 15. The figures for birth under-registration are based on research published in 'The measurement of the reliability of parish registration through same-name methodology', *Academia Online.*
[37] See Razzell, *Population*, p. 47.
[38] Razzell, *Population*, p. 47.

fact occur in one part of the British Isles where the growth of population was not matched by that of industry. This was in Ireland, where the pressure of population resulted in small famines in 1817-18 and 1822 and a catastrophic famine in 1846.'[39]

Ireland's population history reveals a new perspective on the debate about Britain's demographic and economic history. There is however little historical demographic data for Ireland, except for that on Irish Quakers. The following Table summarizes an analysis of reconstitution schedules, using same name correction ratios.[40]

Table 12: Estimated Quaker Infant Mortality (Per 1000) in England and Ireland, 1650-99.

Place	*Infants At Risk*	*Infant Deaths*	*Same-Name Ratio*	*Estimated IMR*
London	330	113	12/12	342
Bristol & Norwich	691	117	111/86	219
Provincial England	2781	293	304/181	177
Dublin	591	149	45/38	299
Cork, Wexford, Waterford & Limerick	966	131	54/44	166
Rural Ireland	1953	120	75/56	82

Infant mortality was much lower in rural Ireland than elsewhere in Britain, reflecting an urban/rural gradient in mortality. This pattern persisted in the period after the 1650s, as revealed in the following table,

Table 13: Estimated Infant Mortality (Per 1000) Amongst Quakers in Great Britain, 1650-1849.

Period	London	Bristol & Norwich	Provincial England	Dublin	Cork. Wexford. Waterford & Limerick	Rural Ireland
1650-99	342	219	177	299	166	82
1700-49	269	216	200	196	160	118
1750-99	166	158	124	164	151	82
1800-49	132	107	69	107	62	41

After an increase in mortality in the first half of the eighteenth century, infant mortality fell very significantly in rural areas, to very low levels in the first half of the nineteenth century.

The mortality rates in Ireland according to the 1841 Census were significantly lower in the rural districts than the urban areas.

Table 14: Age Specific Death Rates in Ireland According to the 1841 Census.[41]

Age Group	*Number Living*	*Deaths Per*	*Number Living in*	*Deaths Per*

[39] Ibid, 224.
[40] I have analysed the original schedules compiled by Vann and Eversley which were deposited in Friend's House in London. See R.T. Vann and D.E.C. Eversley, *Friends in Life and Death*, 1992 for a description of their research.
[41] K.H. Connell, *The Population of Ireland, 1750*-1845, 1950, p. 193.

(Years)	*in Urban Areas*	*1000*	*Rural Districts*	*1000*
Under 1	50,369	138.02	311,055	81.35
2-5	105,676	45.49	779,313	17.22
6-15	243,551	9.78	1,813,605	4.51
16-25	242,237	9.90	1,403,660	6.56
26-35	181,208	13.34	973,169	8.34
36-45	132,481	18.42	696,961	11.43

Mortality in the urban areas was up to twice as high as in the rural districts, mirroring the mortality gradient in the Quaker data. According to the 1841 Census 1,135,465 people lived in urban areas and 7,039,659 in the rural districts,[42] so most of the Irish population lived in rural areas.

It was the unanimous opinion of authors writing of the condition of rural inhabitants that the majority lived in great squalor. According to a Scottish agriculturalist 'a large proportion of the peasantry live in a state of misery … Their cabins scarcely contain an article that can be called furniture; in some families there are no such things as bedclothes, the peasants showed some fern, and a quantity of straw thrown over it, upon which they slept in their working clothes.'[43]

Likewise, Cambell wrote of the Irish in 1777:

> the manner in which the poor of this country live, I cannot but help calling beastly. For upon the same floor, and frequently without any partition, are lodge the husband and wife, the multitudinous brood of children, all huddled together upon the straw or rushes, with the cow, the calf, the pig, and the horse, if they rich enough to have one.[44]

Connell concluded that 'almost every reference to the subject by travellers and doctors underlines the filthiness both of the persons of the mass of the Irish and the interior and surroundings of their cabins …'[45] The result was the prevalence of typhus, griping diarrhoeas and epidemic dysenteries. However, as Connell also concluded, 'the years of rapid population increase, it is true were free from serious epidemics'.[46]

It suggests that personal and domestic hygiene was not critical for lower mortality, and that rural Ireland's relatively low mortality was the result of its geographical isolation. The Irish rural population lived in scattered settlements in a country that was separated both from England & Wales and the Continent of Europe. Disease spreads rapidly in urban environments because of the proximity and density of population, which were not characteristics of rural Ireland.

We may speculate that like England, Ireland's population history was shaped by a pattern of demographic transition. Falling mortality triggered a population increase and a

[42] P.E. Razzell, 'Population growth and economic change in eighteenth and early nineteenth century England and Ireland', in E.L. Jones and G.E. Mingay (eds.), *Land, Labour and Population in the Industrial Revolution*, p. 272.
[43] Connell, *The Population*, p. 58.
[44] Ibid.
[45] Ibid, p. 187.
[46] Ibid, p. 257. Some of the decline in infant and child mortality would have been the result of the practice of smallpox inoculation in rural Ireland. See Razzell, 'Population growth', pp. 270-273.

surplus of labour, resulting in the growing pauperisation of the poor. Pauperisation led to demoralisation, as described by Malthus, resulting in early marriage and the growth of fertility. The Irish Poor Inquiry Commission was told by a Catholic curate from Mayo that 'small holders are induced to marry by feeling that their condition cannot be made worse, or, rather they know that they can lose nothing, and they promise themselves some pleasure in the society of a wife.'[47] Likewise, 'from Kilkenny – as indeed, from most other counties – there came almost the same story: labourers get married under the idea they cannot make their condition worse than it is.'[48]

• • • • •

Jane Whittle has summarized the impact of population on the development of capitalism in the medieval period:

> Fluctuations in population levels have been used to explain some of the most important trends in medieval and early modern history, trends with vital importance to the development of capitalism … Manorial lords had retained their hold on the economy in the century before the Black Death because of the high demand for land. Once this factor was removed by population decline, the diversified economy undermined the manorial lord's position … Peasants, or rather wealthy peasants, had capitalized on the fifteenth century situation, building up their land holdings, and orientating themselves increasingly towards market production … Additionally … there was no shortage of labour in the sixteenth century [for the growth of capitalism].[49]

At a later date Lawrence Stone noted a process of social polarisation that had taken place in England during the sixteenth century as a result of population growth:

> The excess supply of labour relative to demand not only increased unemployment but forced down real wages to an alarming degree … [there was] a polarisation of society into rich and poor: the upper classes became relatively more numerous, and their real incomes rose; the poor also became more numerous and their real incomes fell.'[50]

According to Phelps Brown and Hopkins in their study of builders' real wages during the period 1264-1954, 'the lowest point we record in seven centuries was in 1597, the year of *Midsummer Night's Dream*.'[51] This is also what occurred in Shakespeare's Stratford during the same period. Although there is no evidence on the population history of Stratford, there is for a neighbouring group of five rural parishes in the Forest of Arden, fifteen miles north of Stratford. Population increased rapidly in the sixteenth century, from about 2,250 in the 1570s to 3,400 in 1650.[52] Although not entirely reliable, Wrigley and Schofield estimated that the population of England & Wales increased from 2,773,851 in 1541 to 4,011,563 in 1601,[53] an increase largely the result of the gradual disappearance of the plague.

---

[47] Ibid, p. 57.
[48] Ibid,
[49] J. Whittle, *The Development of Agrarian Capitalism: Land and Labour in Norfolk, 1440- 1580*, 2000, pp. 18, 310.
[50] Razzell, *Essays*, p. 238.
[51] P.E. Razzell, *William Shakespeare: The Anatomy of an Enigma*, 1991, p. 140.
[52] Ibid, p. 12.
[53] E.A. Wrigley and R.S. Schofield, *The Population History*, p. 208.

As a consequence of this growth in population the price of arable produce trebled in the Forest of Arden area, and cattle more than doubled during the same period.[54] Rents in this area 'often lagged behind prices to quite an extraordinary extent', and the result was a marked increase of the wealth 'of the farmer, as against the landless labourer or craftsman on the one hand, and the landlord on the other.'[55] This was reflected in national trends with yeomen farmers noted for their increasing wealth, including the 'great rebuilding' of farmhouses and the growth in the consumption of a range of domestic goods.[56]

This increasing gap between the poor and the rich as we have seen was also recorded by Lawrence Stone at a national level and represents the development of capitalism. In Stratford at the end of the sixteenth century about forty per cent of the population were designated as poor,[57] whereas at the same time one-hundred-and-twenty of the leading townsmen were found illegally to be hording grain and barley.[58] This resulted in a serious riot, described by Abraham Sturley in a letter to his friend Richard Quiney:

U shall understande, brother, that our neighbours are growne with the wantes they feele throughe the dearnes of corne … malecontent. Thei have assembled together in a great nomber, and travelld to Sir Tho. Luci on Fridai last to complaine of our malsters; on Sundai to Sir Foulke Gre. and Sir Joh. Conwai. I should have said on Wendsdai to Sir Ed. Grevll first … Tho. West, returning from the ij knights of the woodland, came home so full that he said to Mr. Baili that night, he hoped within a weeke to leade some of them in a halter, meaninge the malsters … to se them hanged on gibbettes att their owne dores.[59]

This can be seen as an anticipation of Marx's account of the conflict between capital and labour, although it was fuelled more by population increase than an independent development of the economy.

. . . . .

The reduction in mortality had a different effect on the marriage patterns of the wealthy and the poor. For the elite, lower mortality allowed them to marry later, whereas for the poor it meant a pressure on subsistence resulting in demoralization and earlier marriage. A part of this demoralization was a rise of illegitimate births among the poor at the end of the eighteenth and beginning of the nineteenth century.[60]

The pressure on subsistence amongst the poor is reflected in the proportion of labourers who left wills in this period. This is indicated by evidence on agricultural occupations in Cambridgeshire and Bedfordshire.

Table 15: Percentage Distribution of Wills in Cambridgeshire and Bedfordshire, 1601-1800.[61]

[54] V. Sharp, *Crisis and Development: An Ecological Case Study of the Forest of Arden, 1570-1674*, 1978, pp. 13, 47.
[55] Ibid, pp. 68.71.
[56] Ibid, pp. 62, 70.
[57] E. Fripp, *Master Richard Quiney*, 1924, p. 177.
[58] B. Rowland Lewis, *The Shakespeare Documents*, 1940, p. 284.
[59] Ibid, 227.
[60] See the data on the increase in illegitimacy during this period in Wrigley, Davies, Oeppen & Schofield, *English Population*, p. 219.
[61] The data for Cambridgeshire is taken from N. Evans, 'Occupations and status of male testators in Cambridgeshire, 1550-1750', in T. Arkell, N. Evans and N. Goose (eds.), *When Death Do Us Part*, 2000, p.

Period	*Farmers & Yeomen*	*Husbandmen*	*Labourers, Shepherds, Servants*	*Number of Wills*
1600-1649	42.4%	27.8%	29.8%	2023
1650-1699	65.6%	17.6%	16.9%	2000
1700-1749	64.7%	16.0%	19.3%	2409
1750-1799	82.1%	8.5%	9.5%	1495

Although not conclusive, the probate data on the changing distribution of occupations is consistent with the increasing pauperisation of labourers and husbandmen and the growing wealth of farmers and yeomen in the South of England.[62] The pauperisation of labourers is confirmed by the literary evidence. This can be illustrated by one of the most detailed accounts provided by the Reverend John Howlett, who had been the Vicar of Great Dunmow in Essex for about 50 years. Describing the condition of labourers he wrote in 1796:

for the last forty or fifty years, some peculiarly favoured spots excepted, their condition has been growing worse and worse, and is, at length, become truly deplorable. Those pale famished countenances, those tattered garments, and those naked shivering limbs, we so frequently behold, are striking testimonies of these melancholy truths.[63]

He argued that these developments were the result of 'the rapid increase of population on the one hand and from the introduction of machines and variety of inventions … [which have led to] more hands than we are disposed or think it advantages to employ; and hence the price of work is become unequal to the wants of the workmen.'[64] Howlett's mention of agricultural improvement and technology indicates that it was an additional factor in the creation of labour surpluses, which occurred particularly in the nineteenth century. One of Mayhew's informants who had worked in Lancashire described how 'in 1837 the "self-actors" [machined with steam power] had come into common use. One girl can mind three pairs – that used to be three men's work – getting 15s. for the work which gave three men £7.10s. Out of one factory 400 hands were flung in one week, men and women together.' [65]

However, industrialisation also helped raise the wages and the standard of living of workers and informants told Mayhew how a number of factors – new technology, railways, more efficient farming – had improved their lot from the mid-1840s onwards.[66] Capitalism requires cheap labour to flourish, but technology eventually erodes this cheapness of labour.

181; the Bedfordshire material is derived from P.E. Razzell, C. Spence and M. Woollard, 'The evaluation of Bedfordshire burial registration, 1538-1851', *Local Population Studies,* 84, 2010. Labourers and husbandmen who left wills were much poorer than yeoman and farmers. In 1585-1638 in Essex, Kent, Buckingham, Surrey and Suffolk the average assets bequeathed by yeomen/farmers was £406, whereas that bequeathed by husbandmen was £87 and that by labourers £42. See G. Clark and G. Hamilton, 'Survival of the richest; the Malthusian mechanism in pre-industrial England', *Journal of Economic History*, 66, 2006, p. 11. In a sample of inventories from eight parts of England in 1675-1725, the equivalent figures were: Yeomen/Farmers £165, Husbandmen £32, Labourers £16. L Weatherill, *Consumer Behaviour and Material Culture, 1660-1760*, 1988, p. 212.

[62] For other evidence see also Razzell, *Essays*, pp. 232, 233.

[63] J. Howlett, *A n Examination of Mr Pitt's Speech in the House of Commons on 12 Feb. 1796, Relating to the Condition of the Poor*, 1796, 2. For a similar account of the condition of labourers, see D. Davies, *The Case of Labourers in Husbandry*, 1796, p. 7.

[64] Ibid, p. 19.

[65] Introduction to Henry Mayhew's Morning Chronicle Survey of Labour and the Poor: The Metropolitan Districts' in *Razzell Academia*.

[66] Ibid.

Howlett compiled figures of income and expenditure, using details of wages from farmers' wage books and local knowledge of family incomes and consumption, for the two ten-year periods, 1744-53 and 1778-87. The annual expenditure per family in the first period was £20.11s.2d and earnings £20.12.7d, leaving a surplus of 1s.5d. In the second period the figures were £31.3s.7d and £24.3.5d, leaving a deficit of £7.0s.2d.[67] Howlett concluded that

> Of this deficiency the rates have supplied about forty shillings; the remaining £5 have sunk the labourers into a state of wretched and pitiable destitution. In the former period, the man, his wife, and children, were decently clothed and comfortably warmed and fed: now on the contrary, the father and mother are covered with rags; their children are running about, like little savages, without shoes or stockings to their feet; and, by day and night, they are forced to break down the hedges, lop the trees, and pilfer their fuel, or perish with cold.[68]

This conclusion was supported by virtually all contemporary evidence,[69] including that of Admiral Lord Nelson. In a letter to the Duke of Clarence in 1790 he described the condition of the poor in Norfolk:

> the poor labourer [is] really in want of everything to make life comfortable. Hunger is a sharp thorn, and they are not only in want of food sufficient, but of clothes and firing … [they] cannot afford candles, soap or shoes, and for drink nothing but water, for beer our poor labourers never taste.[70]

The poverty of labourers and the poor was a contributory factor in the wealth for those owning capital. As Malthus wrote: 'farmers and capitalists are growing rich from the real cheapness of labour.' [71] This indicates that this was a further development of capitalism fuelled largely by the increase in population.

* * * * *

The population of England & Wales virtually doubled in the period 1801-1851.[72] This resulted in the increasing poverty of labourers and the poor and the growing wealth of the rich. Much of the decline in real incomes was the result of increasing prices associated with the increase in population, which can be illustrated by the relationship between population growth and the price of bread in London.

---

[67] Ibid, p. 48.
[68] Ibid, p. 49. Enclosure may have played a role in generating surplus labour, but this is a controversial thesis. See J.D. Chambers and J.D. Mingay, *The Agricultural Revolution, 1750-1850.*
[69] Ibid, p. 227; K. Snell, *Annals of the Labouring Poor: Social Change and Agrarian England. 1660-1900*, pp. 412-417.
[70] Ibid.
[71] T.R. Malthus, *Essays in the Principal of Population*, 1989, p. 28.
[72] B.R. Mitchell and P. Deane, *Abstract of British Historical Statistics*, 1971, p. 6.

Table 16: The Relationship between Increasing Population and the Price of Bread in London.[73]

Period	*Mean Population of London*	*Mean Price of 4lbs of Bread in London (Pence)*
1700-49	625,00	5.1
1750-99	788,000	6.4
1801-51	1,631,000	10.7

Mean real wages probably declined in the first half of the nineteenth century,[74] resulting in extreme poverty at times. The Captain Swing riots in 1830 occurred widely in southern and eastern counties, and according to Hobsbawm and Rude 'the basic aims of the labourers were singularly consistent: to attain a minimum living wage and to end rural unemployment ... [much of it the result of] a permanent surplus of labour ... due in the first instance to the growth of population.'[75]

The rural correspondent to the *Morning Chronicle* survey of labour and the poor stated that the labourer's 'employment is precarious, and their wages fluctuating, their lives are spent, in the majority of cases. In constant oscillation between their homes and the workhouse, with no alternative beyond starvation or the gaol.'[76]

Mayhew discussed the sweating system as a part of his analysis of poverty in London. At its worst could be highly dangerous to health and life, as was revealed by someone who had worked for one:

> One sweater I worked with had four children, six men, and they, together with his wife, sister-in-law, and himself lived in two rooms, the largest of which was about eight feet by ten. We worked in the smallest room and slept there as well – all six of us. There were two turn-up beds in it, and we slept three in a bed. There was no chimney, and indeed no ventilation whatever. I was near losing my life there. Almost all the men were consumptive, and I myself attended the dispensary for disease of the lungs.[77]

Charles Shaw in his autobiography described the conditions of workers in the Staffordshire Potteries in the 1830s and 1840s:

> All the great events of the town took place … [in] the marketplace. During the severity of winter I have seen one of its sides nearly filled with stacked coals. The other side was stacked with loaves of bread, and such bread. I feel the taste of it even yet, as if made of ground straw, and alum, and Plaster of Paris. These things were stacked there by the parish authorities to relieve the destitution of the poor. Destitution, for the many, was a chronic condition in those days, but when winter came in with its stoppage of work, this destitution became acute, and special measures had to be taken to relieve it. The crowd in the marketplace on such a day formed a ghastly sight. Pinched faces of men, with a stern, cold silence of manner. Moaning women, with crying children in their arms, loudly proclaiming their sufferings and wrongs. Men and women with loaves or coals, rapidly departing on all sides to

[73] E.A. Wrigley, 'A Simple Model of London's importance in changing English society and economy, 1650-1750', *Past and Present*, 37, 1967, p. 44; B.R. Mitchell and P. Deane *Abstracts of British Historical Statistics*, 1971, pp. 497, 498. The population figures are the averages between the population numbers in 1700, 1750, 1801 and 1851.
[74] Razzell, *Essays*, p. 232.
[75] E.J. Hobsbawm and G. Rude**,** *Captain Swing*, 1973, pp. 22, 163.
[76] P.E. Razzell and R. Wainwright, *The Victorian Working Class*, 1973, p. 3.
[77] Ibid, p. 303.

carry some relief to their wretched homes − homes, well, called such … This relief, wretched as it was, just kept back the latent desperation in the hearts of these people.[78]

This poverty was also a factor in the revolutionary condition of Buckinghamshire in the 1830s:

Numbers of men were out of work, bread was dear, and the Chartist agitation was violently active. Copies of the *Northern Star* and other Chartist papers found their way into every workshop. Meetings were held almost every evening and on Sundays. Some of the speeches advocated physical force as the only remedy … Lectures on Peterloo, the Bristol Riots, the Monmouth Rising, and the Pension List were common. Bad trade, low wages, and dear bread were the stimulating causes of widespread discontentment. Men were driven to their lowest depth of hatred of the governing classes… the country was passing through the throes of a political convulsion which was fast ripening into a revolution. The mechanics institute gradually degenerated into a violent revolutionary club.[79]

Revolution was prevented by the rise in the standard of living after the mid-nineteenth century. The poverty found by Mayhew was gradually alleviated, and this was partly because industrialisation had brought about an improvement in average living standards after the 1840s, mainly through a fall in prices. A number of informants told Mayhew how the fall in prices of bread, meat, fruit and vegetables, clothing and other goods, had improved their lot from the mid-1840s onwards, and this was due to a number of factors – new technology, railways, more efficient farming and foreign imports.[80]

. . . . .

Harley has recently concluded that 'the emergence of Britain's modern growth depended more on a long history of capitalism than on the industrial revolution.'[81] Why did capitalism and the industrial revolution first arrive in England and not elsewhere? Weber gave several reasons why England differed from continental powers:

As a result of its insular position [as an island] England was not dependent on a great standing army. On the continent it was possible for the state to protect its peasantry through its standing army, but in England this was not possible. As a result, England became the classical land of peasant eviction. The labour force this threw on the market made possible the development of the domestic small master system ... Thus, while in England shop industry arose, so to speak, by itself, on the continent it had to be deliberately cultivated by the state ... This is by no means fortuitous but is the outcome of continuous development over centuries... the result of its [England's] insular position.'[82]

In essence what Weber is saying here is that capitalism first developed in England as a result of its geographical position as an island, allowing to protect itself by the use of a navy rather than a standing army. England's insular position allowed the development of capitalism at a very early stage from the thirteenth century onwards. According to Unwin

[78] C. Shaw, *When I Was a Child*, 1980, pp. 42, 43.
[79] J. Buckmaster, *A Village Politician*, 1982, pp. 98, 99, 124, 153.
[80] Ibid, p. 311.
[81] C.K. Harley, 'British and European industrialization' in L Neal and J.G. Williamson (eds.), *Capitalism: Volume 1: The Rise of Capitalism from Ancient Origins to 1848*, 2014, p. 492.
[82] Razzell, *Essays*, p. 78.

During the thirteenth century there was an increasing shift of industry away from urban areas to the countryside … which permitted cloth producers to take advantage of cheap labour away from the prohibitive restrictions of the guilds … Textile skills were traditional there and the rural overpopulation made labour available …[83]

The development of capitalism in rural areas in the fifteenth and sixteenth centuries is well documented,[84] and contemporaries contrasted the freedom of trade in England compared to the situation in France.[85] In France the crown had used its standing army to impose taxes and control of the economy, inhibiting entrepreneurial activity, whereas in England the absence of a standing army allowed the flourishing of trade free of royal control.[86]This was a critical factor in the English civil war, with the crown losing its war with parliament due to its lack of a standing army.[87]

In Shakespeare's Stratford an attempt to supress the forestalling of grain in 1598 was undermined by the inability of the government to enforce legislation. The poor had appealed to the four local landed magistrates for protection, not realising that all of them were leading forestallers of grain themselves.[88] In England, the lack of a central authority supported by a standing army was critical in the development of free trade and the spread of capitalism.

However, population growth provided the surplus labour required for the development of capitalism and this is a process that has occurred in the modern period in China and elsewhere in the world.[89] It is unclear whether this in the long run will continue to operate, but this is an issue beyond the scope of the present paper.

[83] P.T.H. Unwin, 'Town and trade 1066-1500' in R.A. Dodgson and R.A. Butlin (eds), *A Historical Geography of England and Wales*, 1978, p. 136.
[84] J. Whittle, 2000; L Shaw-Taylor, 'The rise of agrarian capitalism and the decline of family farming,' *Economic History Review*, 65, 2012.
[85] Razzell, *Essays*, pp. 88, 89.
[86] Ibid.
[87] See P.E. Razzell, 'A sociological analysis of the English civil war' in *Essays*, pp. 84-145, Academia Online.
[88] Razzell, *William Shakespeare*, p. 142.
[89] See 'Asian population growth and the increase of economic inequality in Britain' in Razzell, *Essays.*

The Measurement of the Reliability of Parish Registration through Same-Name Methodology.

It was common in England to give the name of a dead child to a subsequent sibling of the same sex. This can be illustrated by the example of one London family published by the genealogist Percival Boyd and traced in the 1695 London Marriage Duty Listing.

Table 1: The Family of Samuel and Sarah Fowler, Tyler and Bricklayer, of St. Antholin's, London. [1]

Name Of Child	*Date Of Baptism*	*Date Of Burial*
Thomas	05/07/1677	04/01/1721
Samuel	**04/05/1679**	**29/04/1681**
William	08/01/1683	03/06/1708
Samuel	10/05/1685	15/02/1688
John	**07/08/1687**	**-**
John	**12/05/1689**	**09/10/1692**
Sarah	22/04/1691	06/02/1748
Mary	18/07/1693	12/11/1694
John	21/11/1695	-
1695 Marriage Duty Listing: Samuel Fowler, Wife Sarah, Son James, Son Thomas, Son William, Daughter Sarah. Of St. Antholin's Parish.		

Of the three-baptism same-name cases, high-lighted in bold, two of them were traced in the burial register. The second same-name case − John baptised on the 7th of August 1687 − was found neither in the burial register nor in the 1695 Marriage Duty Listing, indicating that he probably died without being registered. (The last John was baptised in late 1695 and therefore did not appear in the Marriage Duty Listing made before that date).

The same-name method allows for the correction of burial under-registration by multiplying the number of same-name cases divided by the number of such cases found in the burial register. In the case of the Fowler family the correction ratio is 3/2. This inflation ratio corrects both for non-registration due to omission from the burial register, as well as burial in neighbouring parishes and elsewhere, accounting for all forms of under-registration. The repetition of the name Samuel in the burial register indicates a burial same name pattern. He was baptized in 1685 before he was buried in 1688 – in effect showing that baptism registration was perfect.

Data on the frequency of same naming from the sixteenth to the nineteenth century is suggested by the following Table.

[1] For the background to this table see P.E. Razzell and C. Spence, 'The History of infant, child and adult mortality in London', *The London Journal*, 2007, p. 274.

Table 2: Proportion of Eligible Families Using Same Names in Six Reconstitution Parishes, 1541-1837.[2]

Period	*Number of Eligible Cases*	*Proportion Using Same Names %*
1541-1600	293	50.1
1601-1650	330	57.9
1651-1700	291	72.9
1701-1750	339	67.8
1751=1800	411	65.6
1801-1837	270	59.5

The data only covers six parishes, but it indicates that many families used same names throughout the parish register period. There was something of an inverted U-Curve distribution in the proportions using same-names, but there is a sufficient majority to make same-naming a valuable basis for assessing the reliability of parish registers.

There has been a criticism of the technique on the grounds that there were living same-name children. A study of Wills indicates the following pattern of living same name children.

Table 3: Living Same-Name Children in English Wills, 1439-1699.[3]

Period	*Number of Living Same-Name Children*	*Total Number of Siblings*	*Proportion of Living Same-Name Children*
1439-1547	77	1249	6.20%
1558-1599	10	713	1.40%
1591-1649	22	2638	0.80%
1650-1699	4	985	0.40%

There were significant numbers of living same-name children in the fifteenth and early sixteenth century, although some of them may have been the result of stepbrothers and stepsisters. After 1558 there were very few living same-name children, some of whom might have been stepchildren. Houlbrooke has argued that this was the result of the aftermath of the Reformation:

> The greater variety of opinion about the bestowal of names which prevailed after the Reformation gave parents more freedom to follow their own inclinations. One result was that the bestowal of the same name on more than one living child became much less frequent from the sixteenth century onwards. But in many cases parents continued to give babies the same name as older siblings who had died.[4]

The progressive reduction of living same name children may also have been the result of the introduction of parish registration, making it difficult to have two living same name children.

The only complete way of examining the reliability of data on same names is to study

[2] Eligible families are those with at least two baptised children of the same sex, to the same parents. The table is based on the analysis of original reconstitution schedules for Aldenham, Bridford, Austrey, Dawlish, Hartland and Colyton. See P.E. Razzell, *Population and Disease: Transforming English Society 1550-1850*, 2007, p. 9.

[3] Data Taken from P.E. Razzell, 'Debates in population history: Living same-name siblings In England, 1439-1851', in *Local Population Studies,* September 2011, p. 67.

[4]. R.A. Houlbrooke, *The English Family 1450-1750*, 1984, pp 131-32.

local censuses which indicate the status of children and parents. For the late seventeenth century it is possible to examine systematicallythe question of living same-name siblings through the analysis of various enumerations taken under the 1695 Marriage Duty Act.[5] A study was made of eighteen census-type listings covering a total of 6,162 cases. The areas covered were the City of London (1695), Bristol, Gloucestershire, (1696). Goodnestone, Kent (1676), Clayworth, Nottinghamshire (1676 and 1688), Lichfield, Staffordshire (1697), Lyme Regis, Dorsetshire (1696, 1698 and 1703), Swindon, Wiltshire (1697 and 1702), Wanborough, Wiltshire (1697 and 1702), New Romney, Kent (1696 and 1699), Melbourne, Derbyshire (1695), and St. Mary's, Southampton, Hampshire (1695 and 1696). There were 0.15 per cent of children with the living same name children, almost exclusively in the City of London and Bristol.[6]

Galley, Garrett, Davies and Reid have argued that the London and Bristol censuses provide convincing details of living same-name children.[7] However an examination of the original manuscript censuses, along with data on baptisms, reveals that all these cases are questionable on grounds of transmission errors and other problems.[8]

It is possible to examine this issue further through the study of nineteenth century censuses, with existing research on 45 parishes covered by census/ baptism registers.[9] The names of 10,954 people living in these parishes were selected from the household schedules of the 1851 Census and found to include no living full same-name cases. In most of these censuses there are references to stepbrothers and sisters sharing the same forename, but these canbe recognized by their different surnames or other information in the censuses. Also, in the nineteenth century there are cases of living siblings sharing one common forename (for example, EdwardJames and Edward George), but no cases have come to light where names are identical. It is therefore important for same-name research that only siblings sharing the same parents and with identical names are selected for study.

For research on the reliability of birth registration it is necessary to locate burial same-name children, and then search for the baptism of the second same-name child. For death registration the reverse is the case: location of same-name children in baptism registers searching for the burial of the first same-name child. There were many more cases in the evaluation of death registration because of the use of baptism registers to select the same-name cases, whereas there were many fewer cases in selection from burial registers.

Research carried out on groups of parishes used in previous work reveals the following pattern of birth and death registration.

.

[5] See Razzell, *Population and Disease*, p. 10.
[6] P.E. Razzell, 'Living same-name siblings and English historical demography; a commentary' *Local Population Studies*, 2011, p. 77.
[7] C. Galley, E. Garrett, R. Davies and A. Reid, 'Living same-name siblings and English historical demography: a reply to Peter Razzell', *Local Population Studies*, 2011.
[8] P.E. Razzell, 'Living same-name siblings and English historical demography: a commentary', *Local Population Studies*, 2011.
[9] See P.E. Razzell, 'The evaluation of baptism as a form of birth registration through cross-matching census and parish register data: a study in methodology', *Essays in English Population History*, p. 93.

Table 4: Estimated Under-Registration of Births and Deaths in England, 1538-1837.[10]

Period	*Total Number of Births*	*Proportion of Births Not Registered (%)*	*Toal Number of Deaths*	*Proportion of Deaths Not Registered (%)*
1538-1599	95	39	358	34
1600-1649	236	36	465	31
1650-1699	230	30	617	27
1700-1749	424	21	858	22
1750-1799	546	32	594	27
1800-1837	133	30	451	23

The figures for death registration are based on nine Cambridge Group reconstitution parishes.[11] I have made a special study of the burial registration of two Cambridge Group parishes, Colyton and Hartland, given their importance for the population history of England.[12] E.A. Wrigley initiated this research through the analysis of Colyton's population history, which was the forerunner of subsequent demographic research. The result of same-name research on Colyton was as follows:

Table 5: Analysis of Burial Registration of Same-Name Siblings in Colyton, 1538-1851.

Period	*Total Number of Cases*	*Cases Traced in the Burial Register*	*Proportion of Untraced Cases*
1538-1600	95	63	35%
1601-1650	121	71	41%
1651-1700	114	86	25%
1701-1750	84	54	36%
1751-1800	94	60	36%
1801-1851	115	98	15%
Total	623	432	31%

There is no linear trend in the proportion of untraced cases, but there was a sharp improvement in burial registration during the period 1801-1851.This can be compared to parish register entries with civil register returns for the period 1837-1850.[13] According to the Colyton civil register, there were 199 children dying under the age of ten in 1837-50, of which 170 were registered in the Anglican parish register, an omission rate of 15%.

This figure is identical to the 15% of same-name case children not traced during 1801-1851. It is also possible to compare evidence on people leaving wills with entries in the burial register, and of of124 wills registered in Colyton in 1553-1773 – 28% - could not be found in the burial register – slightly smaller than the untraced cases in 1538-1800 in Table 4. This and the above research is an example of the triangulation of data, a methodology appropriate for historical demographic research.

The main reason for omissions of birth and deaths was clerical negligence,[14] as indicated by Burn in his study of parish registers:

[10] For death under-registration see Razzell, *Population*, p. 15. The figures for birth under-registration are based on the analysis of 69 burial and baptisms registers mainly from the counties of Bedfordshire and Derbyshire.
[11] See Razzell. *Population*, p. 15.
[12] See P.E. Razzell, *Essays in English Population History*, 1994, pp. 108-111
[13] I was allowed special access to the original returns in the civil register by the local registrar.
[14] See Razzell, *Essays*, pp. 108-111.

> The custody of parish registers having been frequently committed to ignorant parish clerks, who had no idea of their utility beyond their being occasionally the means of putting a shilling into their own pockets for furnishing extracts, and at other times being under the superintendence of an incumbent, either forgetful, careless or negligent, the result has necessarily been, that many Registers are miserably defective, some having the appearance of being kept from month to month, and year to year, yet being deficient of a great many entries.[15]

This clerical negligence appears to have been present from the sixteenth century onwards. For example, 'in 1567 the incumbent of Tunstall, Kent, appeared to have tired of registering the Pottman family because of its concentration in the parish and simply stated in the register: "From henceforwd I omit the Pottmans." '[16]

Some of the neglect of burial registration was due to the non-payment of fees. In the Northamptonshire parish of Brington, 'the very true reason why this register, is found as imperfect in some years as from 1669 to 1695 is because the parishioners could never be persuaded to take to see it done, nor the churchwardens as ye canon did require, and because they refuse to pay such dues to ye curate as they ought by custome to have payed.'[17]

In 1702-03 'a committee of Convocation drew up a list of ecclesiastical offences notoriously requiring remedy, in which irregularity in keeping registers is prominent in the list of gravamina.'[18] Evidence for clerical negligence became abundant in the early nineteenth century. The *Gentleman's Magazine* remarked in 1811 that 'the clergyman (in many country places) has entered the names at his leisure, whenever he had nothing better to do, and perhaps has never entered them at all.'[19] The *Report of the Select Committee on Parochial Registration in 1833* provided substantial evidence on the reasons for defective parish registration. One of the witnesses, Mr William Durrant Cooper, a solicitor, had extensive experience of tracing individuals in parish registers for property cases, and concluded that parish registration was 'exceedingly defective … [with] a very large number of marriages, deaths and baptisms not entered at all … especially deaths.'[20] To illustrate this, he gave the following example:

> On the sale of some property [in 1819] from Mr Cott to Lord Gage, it was necessary to procure evidence of the death of three individuals, Mrs Pace, Mr Tuchnott and Mrs Gouldsmith. They were at different places, all in Sussex; Mrs Pace was regularly entered; Mr Tuchnott was buried at Rodmell, about five miles from Lewes, and on searching for the register of burial we found no entry whatever. On making an inquiry in the churchyard of the sexton, he stated he recollected digging the grave, and the ceremony being performed; Mr Gwynne, the rector, whose neglect in that and other parishes is well known, had omitted to enter it … Mrs Gouldsmith, who was buried at Waldron, in the same county, was not entered, but on going to the parish clerk, who was a blacksmith, he stated he recollected the circumstance, and accounted for her burial not being entered in this way: he said it was usual for him, and not the clergyman, to take account of the Burials, and he entered them in a little sixpenny memorandum book … If it so happened that the fee [of one shilling] was paid at the time, as was the case with affluent persons, no entry would appear in his book, he only booked what was due to him, and as the clergyman entered the parish register at the end of the year from his book, and not at the time of the ceremony, all burials that were not entered in his book would not find their way into the register.[21]

Given the significant unreliability of parish registers, it is possible to triangulate findings on

---

[15] J.S. Burn, *The History of Parish Registers in England*, 1862, p. 18.
[16] Ibid, p. 41.
[17] J.C. Cox, *The Parish Registers of England*, 1910, pp. 20, 21.
[18] W.E. Tate, *The Parish Chest*, 1969, p. 49.
[19] Burn *The History*, p. 42.
[20] *Report of the Select Committee on Parochial Registration*, p. 24.
[21] Ibid, 25.

baptism and burial registration through comparison with other measures of reliability. The previous study of forty-five parishes selected from the 1851 Census with information on birth places was compared to the data from same-name research. The results are summarized in Table 5 below.

Table 6: Estimated Proportions of Unregistered Births, 1761-1837.[22]

Period	*Proportion of Unregistered Births Trough Census Baptism Comparison*
1761-1800	32%
1801-1833	31%
Period	*Proportion of Unregistered Births Through Same Naming*
1750-1799	32%
1800-1837	30%

The proportions of unregistered births using the two different methods of estimating the accuracy of birth registration are virtually identical. The comparison should not be taken too literally as none of the figures above are based on random samples.

The most significant finding from this research is the very high proportion of births unregistered in the sixteenth and seventeenth centuries – between thirty and thirty-nine per cent. The Cambridge Group assumed that births registered through baptism were perfect between 1539 and 1550 with no births unregistered, and only deteriorated slowly to a maximum of 9.5 per cent omitted by the end of the seventeenth century.[23] The discrepancy between this assumption and the figures in Table 4 poses major problems for Wrigley and Schofield's reconstruction of England's population history.

Existing data suggests that current same-name research is reliable given the triangulation of evidence.[24] However, given the digitisation of parish register and census data, it should be possible in future to create random samples for comprehensive same-name research.

[22] For the figures for the census baptism comparison method see Razzell, 'The evaluation', p. 93.
[23] E.A. Wrigley and R.S. Schofield, *The Population History of England, 1541-1871*, 1981, pp. 537-541.
[24] See for example P.E. Razzell, *Mortality, Marriage and Population Growth in England, 1550-1850*, 2016, pp. 18, 23, Razzell, *Population and Disease,* p. 13.

The Life of Shakespeare: *a Critical Evaluation*.

Introduction.

Shakespeare's early life has remained something of a conundrum despite extensive research into his background. His writing is universally recognized as the outstanding contribution to the history of literature, yet he was the son of a provincial artisan of limited literacy. His father John Shakespeare was a Stratford glover and unable to provide his son with a full education. This has led to the description of Shakespeare as 'the Stratford boor'[1], accounting for why many scholars are unable to accept that he was the author of his plays. His work has been attributed to an extensive range of people of high social and elite status, including among others, Francis Bacon, the Earl of Oxford, and Christopher Marlow.[2] More recently Lena Cowen has suggested that 'we must picture Shakespeare participating in the intellectual culture of Oxford … Shakespeare is nearly certain to have taken in lectures and sermons in college chapels.'[3] Again, this is pure speculation without any convincing evidence to support it.

The problem is that scholars are unable to accept that the son of a provincial artisan with limited education could have been the author of the plays, and most have invented classical sources to address this conundrum. But as Ben Jonson argued, Shakespeare 'had little Latin and less Greek', and did not adhere to classical rules in writing his plays. However, he showed a unique understanding of vernacular language in creating both his comedies and tragedies.

There is also the conundrum of where Shakespeare went after he fathered three children in Stratford before appearing in London, which has been designated as the "lost years". Some have speculated that he spent this period on the continent of Europe or other places enabling him to acquire the sophisticated culture necessary for the writing of the plays.[4] None of these ideas have any credible evidence to support them but there is evidence in plain sight to resolve these difficulties.

According to Nicholas Rowe, Shakespeare worked for his father after he left school at an early age: 'Upon his leaving School, he seems to have given intirely into the way of Living which his Father propos'd to him … tho' he was his eldest Son, he could give him no better Education than his own Employment …'[5] What other biographers have not realized is that John Shakespeare was not just a glover but was a private trader involving participation in a highly sophisticated and metropolitan community.

Nicholas Rowe's *Life of Shakespeare* was the first full biography of Shakespeare, published in 1709.[6] It was largely based on information provided by the actor Thomas Betterton, who made a special visit to Stratford to collect information on Shakespeare's life. Rowe also used material reputed to have originated from Sir William Davenant, rumoured to be the natural son of Shakespeare.

The biography has attracted a great deal of criticism,[7] much of it based on Edmund Malone's work on Shakespeare. Malone wrote: 'It is somewhat remarkable, that in Rowe's Life of our author, there are not more than *eleven* facts mentioned.

1. He was the son of John Shakespeare, and born at Stratford, in April 1564.
2. He dies there in 1616. These are both true, and were furnished by the parish register.
3. His father had ten children

[1] S. Schoenbaum, *Shakespeare's Lives*, 1992, p. viii.
[2] Ibid, pp. 385-451.
[3] L. C. Orlin, *The Private Life of William Shakespeare*, 2021, p. 248.
[4] Ibid, p. 441.
[5] C. Nicholl (ed), *Nicholas Rowe the Life of Shakespeare*, 2009, pp. 26, 28.
[6] C. Nicholl (ed.), *Nicholas Rowe the Life of Shakespeare*, 2009.
[7] K. Duncan Jones, *Shakespeare an Ungentle Life*, 2010, p. 97; Nicholl, *Nicholas Rowe*, p. 7.

4. His father was a woolman.
5. When the poet came to London "he was received into the company of actors there in being," as if there was then but one company.
6. He was but an indifferent actor.
7. *Falstaff* was originally called *Oldcastle*, and that the poet was *obliged* to change the name of that character.
8. Lord Southampton gave him 1000l. to *complete* a purchase.
9. He left *three* daughters.
10. He was driven to take shelter in London in consequence of stealing deer from Sir Thomas Lucy's park.

The preceding eight facts will all be shown to be false.'[8]

As Schoenbaum has written, 'it is largely through Malone's achievement the inadequacies of Rowe's essay were now recognized.'[9] Given the importance of Rowe's biography, I will be evaluating Malone's criticisms of Rowe where they are subject to checks using economic, social and demographic research, as well as documentary sources on the lives of both Shakespeare and his father John. There has been a proliferation of biographies on Shakespeare's life – Nicholl claimed that 'there have been many hundreds of them'[10] – as well as resulting controversies and speculations. Given the latter, I will wherever possible rely on published documentary sources which I will quote fully, but with an acknowledgment of different interpretations of these sources.

Points 5, 6, 7 and 9 of Malone's critique are not major issues, and will not be covered in this essay, and only the problems mentioned by Malone which are possible to check factually will be addressed. This paper will also examine issues beyond the different biographical accounts written by Rowe and Malone. This includes Shakespeare's work with his father in private trading and its influence on his acquisition of the cosmopolitan culture necessary for his later work as a playwright. This research has generated radical new ideas about Shakespeare's life, some of which are necessarily of a hypothetical nature, but based on sources consistent with known evidence.

The Reliability of Parish Registers.

I will cover Malone's criticisms in the order that he made them.

His first two points imply that Rowe relied exclusively on information derived from the Stratford parish register. Yet as Schoenbaum has pointed out, 'the identity of the poet's bride, first published by Rowe', was only unequivocally confirmed in September 1836 by a marriage bond of 28 November 1582.[11] It therefore appears that Betterton managed to obtain information from local sources beyond the information in the Stratford parish register. Also, Rowe stated that John Shakespeare was 'a considerable Dealer in Wool',[12] and it is only in the last few years that this statement has been documented in research into legal documents.[13]

Point three in Malone's criticism requires more extended treatment. Malone assumed that parish registers were a reliable source of information on births and deaths, yet new research

[8] E. Malone, *The Plays and Poems of William Shakespeare … Comprehending a Life of the Poet*, Volume 2, 1821, p. 69.
[9] S. Schoenbaum, *Shakespeare's Lives,* 2006, p. 169.
[10] Nicholl, *Nicholas Rowe*, p.7.
[11] Schoenbaum, *Shakespeare's Lives*, p. 192.
[12] Nicholl, *Nicholas Rowe,* p.26,
[13] See page 3 of the present article. It should also be noted that the monument to Shakespeare in the Stratford Church did not originally depict him with a quill in his hand, but merely had him resting on a woolsack – which according to Nichol, made him look 'more a wool merchant than a poet.' Nicholl *Nicholas Rowe*, pp.74, 75.

has established that between a fifth and a third of all deaths and births in the period 1550-1650 were omitted from parish registers, due to the unreliable practices of clergymen and their clerks.[14] This was probably true of the Stratford parish register, indicated by the omission of the burial of John Shakespeare's first daughter Joan, who had a sibling of the same name baptised at a later date. According to Schoenbaum: 'In April 1569 the Shakespeares gained another daughter. She was christened Joan on the 15th, so apparently the first Joan had died, probably while still an infant, in 1559 or 1560, when burial entries are sparse in the register.'[15]

The poor quality of parish registration is suggested by the practices of John Frith the local clergyman of Temple Grafton, the location of Shakespeare's marriage ceremony. According to Whitgift's 1586 survey of the Warwickshire ministry: 'John Frith, vicar, an old priest and unsound in religion, he can neither preach nor read well, his chiefest trade is to cure hawks that are hurt or diseased, for which purpose many do usually repair to him.'[16]

The quality of birth registration is revealed in the pattern of baptisms of John Shakespeare's children[17]:

Name	*Baptism Date*	*Year*	*Burial Date*
Jone	15th September	1558	
Margaret	2nd December	1562	30th April 1563
William	26th April	1564	
Gilbert	13th October	1566	
Jone	15th April	1569	
Richard	11th March	1574	
Anne	28th September	1578	4th April 1579
Edmund	3rd May	1580	

The usual gap in births during this period was between two and three years,[18] and yet in the periods 1558-1562, 1569-1574, and 1574-1578 it is in the Shakespeare family between four and five years, suggesting the possibility of some missing births. Although not conclusive, it indicates that Nicholas Rowe may have been right about John Shakespeare's ten children.

John Shakespeare as Wool Dealer and Private Trader.

Edmund Malone was not fully aware of John Shakespeare's activities as a dealer in wool and challenged the designation of him as a "woolman". He knew that John Shakespeare was a member of the Stratford council in the late 1550s and 1560s, occupying all roles in the council from borough constable to mayor.[19] However, four legal cases involving John Shakespeare came to light in the Exchequer court, chronicled by D.L. Thomas and N.E. Evans in their article 'John Shakespeare in the Exchequer'. They reveal that the Stratford glover was engaged in subsidiary wool dealings and money-lending transactions, which indicated that John Shakespeare was a dealer in wool on a large scale.[20] An informer revealed that in 1572 John "Shaxspere" of "Stretford super Haven" and John Lockesley of the same place had illegally

[14] P. E. Razzell, *Mortality, Marriage and Population in England, 1550-1850*, 2016, pp. 18-21; P.E. Razzell, The measurement of the reliability of parish registration through same-name methodology, *Academia Online.*
[15] S. Schoenbaum, *William Shakespeare: A Compact Documentary Life*, 1978, p. 27.
[16] Ibid, p. 87.
[17] Malone, *The Plays*, pp. 610, 611.
[18] E.A. Wrigley, R.S. Davies, J.E. Oeppen and R.S. Schofield, *English Population History from Family Reconstitution, 1580-1837*, 1997, pp. 365, 554.
[19] F.E. Halliday, *Shakespeare Companion,* pp. 441.
[20] D.L. Thomas and N.E. Evans, 'John Shakespeare in the Exchequer', *Shakespeare Quarterly*, 35 (1984), pp. 315-18; P.E. Razzell, *William Shakespeare: The Anatomy of an Enigma*, 1990, pp.17-18.

bought 200 tods (i.e. 5,600 pounds) of wool, and later that year John Shakespeare was accused of buying 100 tods of wool.[21]

At an earlier date on the 4th November 1568 John Shakespeare alleged that he had sold John Walford twenty-one tods of wool at Stratford, and that £21 owing in cash had never been paid.[22] It is likely that John Shakespeare traded wool on other occasions, which did not result in prosecutions.

According to Bowden in his study of the wool trade in Tudor and Stuart England, glovers dealt in wool through removing wool in the preparation of the sheep skins. As a result 'glovers in the central and east midlands … were great wool dealers.' [23] Remnants of wool were found in John Shakespeare's Henley Street house traditionally referred to in Stratford as "the woolshop", and Bowden informs us that after the wool was bought, it was most frequently 'carried to the dealer's house or warehouse'.[24]

Wool dealing also contained the seeds of money lending. 'When a seller gave credit for wool he received a higher price for it than he would have done had he accepted payment in ready money. The price of wool sold on credit thus contained an element of interest …'[25] John Shakespeare was prosecuted for illegal money lending, and this probably occurred on other occasions. He also traded in a variety of other products: according to Lee, 'he soon set up as a trader in all manner of agricultural produce. Corn, wool, malt, meat, skins, and leather were among the commodities in which he dealt.'[26] He had dealings with people living in London, Worcestershire, Northamptonshire, Oxfordshire, Coventry, Nottingham and Stoke in Staffordshire.[27]

Nicholas Rowe's description of John Shakespeare as a "considerable dealer in wool" is appropriate given his activities as a wool dealer, but does not allow for the diversity of the business activities that he was engaged in. Rowe's illustration of Shakespeare's monument in Stratford church was based on Dugdale's *Antiquities* and depicts Shakespeare resting on a woolsack without the quill introduced at a later date. As Nicholl has written, this makes Shakespeare 'more a wool merchant than a poet.'[28] The monument may have been commissioned by Shakespeare's grand-daughter Elizabeth Barnard or even possibly by Shakespeare himself during his own lifetime.[29] People living in Stratford at that time appear to have seen Shakespeare as more of a businessman than a dramatist, consistent with the fact that only about a half of the plays were published in his lifetime. This suggests that his literary reputation was not a priority for Shakespeare.

John Shakespeare's Economic and Cultural World.

In the court case against the Lambert family in 1588, John Shakespeare claimed for a missing twenty pounds he had 'totally lost and failed to acquire the whole gain, advantage and profit which he by buying and bargaining with the aforesaid twenty pounds have had and acquired, to the loss of thirty pounds.'[30]

This is the credo – 'buying and bargaining' – of the middleman, a group whose activities Everitt has designated as, 'the free trading between individuals', defined as the 'type of

[21] Thomas and Evans, 'John Shakespeare'; Razzell, *William Shakespeare*, p. 17, 18.
[22] Razzell, *William Shakespeare*, p. 19.
[23] P. J. Bowden, *The Wool Trade in Tudor and Stuart England*, 1962, p. 82.
[24] Ibid, p. 91.
[25] Ibid, p. 101.
[26] S. Lee, *Life of Shakespeare*, 1898, C.U.P. Edition 2012, p. 4.
[27] Razzell, *William Shakespeare*, p. 20.
[28] Nicholl, *The Life*, 71.
[29] See the Wikipedia entry on Shakespeare's monument.
[30] B. Rowland Lewis, *The Shakespeare Documents,* Volume 1, 1940, p. 139.

bargaining which was mostly "free", or emancipated from official control: to dealing between individual traders and manufacturers in private.'[31] However, Everitt writing of 'the conflicting aspirations of the market town and private trader, notes that 'many traders engaged in both spheres of activity, and it would be misleading to draw too sharp a distinction between them.'[32] Most of the leading townsmen of Stratford were private traders and were engaged in the illegal trading of corn,[33] and private trading was ubiquitous in Stratford in the late sixteenth century.[34] An example of this is to be found in a letter in 1598 from Adrian Quyney to Richard Sturley:

'Yff yow bargen with Wm Sha …or receve money therfor, brynge youre money homme that yow maye; and see howe knite stockynges be sold; ther ys gret byinge of them at Aysshome. Edward Wheat and Harrye, youre brother man, were both at Evyshome thys daye senet, and, as I harde, bewtow £20 ther in knyt hosse; wherefore I thynke yow maye doo good, yff yow can have money.'[35]

The activities of leading townsmen in private trading can be further illustrated by the example of Thomas Rogers, Bailiff of the Borough, who in 1595 was a butcher by trade, but was also engaged in extensive illegal buying and selling of corn, malt and cattle.[36] His attitude towards such trading is illustrated by his behaviour. He bought a cartload of barley in order to forestall the market, and when reproached for this, 'doth say that he will justify it, and he careth not a turd for them all.' [37]

In order to understand the rise of private and illegal trading, it is necessary to understand the economic conditions of the time. Population had grown very rapidly in the late sixteenth century, and largely as a result, prices of all commodities had risen very sharply, including wool, barley and other foodstuffs.[38] Using an index of wool prices, it had increased as follows: 1450-99 = 100; 1550-59 = 206; 1590-99 = 315.[39] The price of arable produce trebled between 1530-59 and 1590-1619, whereas cattle and oxen more than doubled during the same period.[40] This had allowed those with capital to exploit these price rises, resulting in the forestalling of grain and speculation in other commodities. As Lewis observed 'those who had ready funds "engrossed and forestalled" … and by holding in bulk … the engrosses and forestallers forced the price rapidly upwards.'[41] The wet seasons of 1594, 1595 and 1596 exacerbated these price rises,[42] leading to great distress amongst the poor.[43] According to Phelps Brown and Hopkins in their study of builders' real wages during the period 1264-1954, 'the lowest point we record in seven centuries was in 1597, the year of *Midsummer Night's Dream.*'[44]

---

[31] J. Chartres (ed), *Agricultural Markets and Trade, 1500-1750: Chapters from the Agrarian History of England and Wales,*1990, p. 92.
[32] Ibid, p. 563.
[33] Lewis, *The Shakespeare Documents*, p. 284.
[34] For example, 120 of the leading townsmen in Stratford – including Shakespeare – illegally hoarded grain in 1598. Lewis, *The Shakespeare Documents*. p. 284.
[35] Ibid, p. 230.
[36] E. Fripp, *Master Richard Quyney*, 1924, p.104.
[37] Razzell, *William Shakespeare*, p. 141.
[38] Razzell, *William Shakespeare*, pp. 11, 12.
[39] Ibid.
[40] Ibid.
[41] Lewis, *The Shakespeare Documents*, p. 282.
[42] Ibid.
[43] The increase in population also resulted in a surplus of labour, which led to poverty and unemployment. In a corporation petition in 1601 it was stated that in Stratford 'our poor are in number seven hundred and odd, young and old.', about forty per cent of Stratford's population. See E. Fripp, *Master Richard Quiney*, 1924, p. 177.
[44] Razzell, *William Shakespeare*, p. 140.

This distress resulted in a threat of violence. In a letter from Abraham Sturley to Richard Quiney of the 24 January 1598 he wrote:

U shall understande, brother, that our neighbours are growne with the wantes they feele throughe the dearnes of corne … malecontent. Thei have assembled together in a great nomber, and travelld to Sir Tho. Luci on Fridai last to complaine of our malsters; on Sundai to Sir Foulke Gre. and Sir Joh. Conwai. I should have said on Wendsdai to Sir Ed. Grevll first … Tho. West, returning from the ij knights of the woodland, came home so full that he said to Mr. Baili that night, he hoped within a weeke to leade some of them in a halter, meaninge the malsters … to se them hanged on gibbettes att their owne dores.[45]

As a result of a general agitation, the Privy Council required local authorities to make a note of corn and malt in their towns. On February 4, 1598 a return of illegal trading in malt was made in Stratford, and more than one hundred and twenty names appear, including that of Shakespeare, his friends Adrian Quiney and Richard Sturley, as well as the four local landed magistrates.[46] What the rioters did not realise was that the local magistrates that they appealed to were some of the leading engrosses of grain, and that all the leading townsmen were private traders engaged in the illegal trade.

This places John Shakespeare in the economic and cultural context of Stratford at this time. There is no inconsistency between regular participation in corporation affairs, and life as an individual trader, including visits to London and elsewhere. In fact, John Shakespeare was prosecuted for usury and wool-dealing at the very time he had achieved highest office in Stratford – 1568-71 – when he was bailiff and chief alderman and had visited London with Adrian Quiney on council business.[47]

Everitt has shown that this type of trading grew rapidly in the sixteenth century, particularly after about 1570. He studied it through the records of disputes between traders in the Court of Chancery and Requests, which provide a detailed picture of John Shakespeare's economic and cultural world. Only about a third of country-wide private transactions took place in the same county in the Midland region, [48] consistent with the pattern of John Shakespeare's trading disputes.

All transactions were conducted on a credit basis, for which legal bonds were drawn up by a lawyer or scrivener.[49] According to Everitt, because of the absence of banks, traders necessarily had to rely on their credit in the local community, and this often 'operated through a network of neighbours, friends, and relatives. Sons, fathers, brothers, cousins, wives, uncles, mothers, brother-in-law: all were drawn into the circle.'[50]

He has described the culture which grew up amongst individual traders:

In consequence of this network of kinship and acquaintance, the packmen, carriers, woolmen, and factors who engaged in the private agricultural market were not simply unconnected individuals … Much of the dealing in which travelling merchants engaged took place in farmhouses. Some took place in barns, and some in warehouses and corn-chambers. Perhaps the most characteristic meeting place of the wayfaring community, however, was the provincial inn. The Elizabethan inn has no exact counterpart in the modern world. It was the hotel, the bank, the warehouse, the exchange, the scrivener's office, and the marketplace of many of a trader.[51]

[45] Lewis, *The Shakespeare Documents*, p. 227.
[46] Ibid, p. 284.
[47] Ibid, p. 26.
[48] Chartres, *Agricultural Markets*, p. 99.
[49] Ibid, p. 93.
[50] Ibid, p. 106.
[51] Ibid, pp. 107, 108.

Everitt has elaborated on the role of the innkeeper in trading activities:

The Tudor and Stuart innkeeper was thus in a powerful position to influence the course of private trading. Many a publican provided cellars or outbuildings for the storage of his client's goods. Some converted their halls or parlours into private auction rooms … Agreement between prospective dealers was rarely reached without a lengthy series of "speeches" and "communications", and the company often sat far into the night before the transaction was concluded. Sometimes an unscrupulous innkeeper would allow some hapless yeoman (well plied with ale) to be "cozened of his money" by the "glozing terms … smooth words, and fair speeches" of the other party concerned … When the bargain was agreed, the local scrivener (sometimes himself one of the guests) was called upon to draw up one of the bonds, and the deed was read out to the assembled company … not infrequently one of the signatories later confessed himself unable to read it …[52]

The problem arose because of the poor educational system. 'Many marketing disputes arose through the illiteracy of one or other of the parties concerned.'[53]Many of the traders were helped by assistants, who 'undertook the writings of his order books, notes, and letters …'[54] Because of the writing involved in trading transactions, the aid of his son William would have been invaluable to the semi-literate John Shakespeare. As Everitt has concluded, 'with the growth of private dealing some grounding in writing and accounting was imperative.'[55] Lena Orlin has argued

For property transactions, wholesale operations, and other aspirational ventures, records and documents were vital. At Stratford's grammar school, William Shakespeare developed skills that were useful to an upwardly mobile family. By the time he was 10, he may have thought of himself as his father's partner.'[56]

According to Rowe, William Shakespeare worked for his father after he left school at an early age. There is some independent evidence to support Rowe's statement, and it involves the dispute about the purchase of land in Wilmcote that John Shakespeare had with his bother-in-law Edmund Lambert and his son John. The dispute is highly complex, and it is discussed in detail in my book on Shakespeare.[57] The following is an extract from the court proceedings relevant to the evidence of William Shakespeare's part and status in the dispute.

On the first day of March [1587] … he [Edmund Lambert] died … after whose death … [the land] descended to the aforesaid John Lambert, as son and heir of the said Edmund … the said John Shakespeare his wife Mary together with William Shakespeare their son, when claim had been made upon them, covenanted the said [land] … to said John Lambert and … delivered all writings and proofs concerning the said premises … besides that, he, the same John Shakespeare, and Mary his wife, at the same time with William Shakespeare their son, have always been ready hitherto not only for covenanting the aforesaid premises but also for delivering to the same John Lambert all writings and proofs concerning the same …'[58]

This is evidence that Shakespeare was still working with his father in 1587 and 1588, providing assistance to his father who was only semi-literate. His role appears to have been mainly

[52] Ibid, p. 110.
[53] Ibid, p. 115.
[54] Ibid, p. 104.
[55] Ibid, p. 116.
[56] L. Orlin, *The Private Life*, p. 46.
[57] See 'The Shakespeare/Lambert Dispute' in Razzell, *William Shakespeare*, pp.35-45.
[58] Lewis, *The Shakespeare Documents*, pp. 138, 139.

helping with the delivery and working on written records, invaluable assistance to his father at this time. However, this interpretation has been disputed by E.K. Chambers:

> This is the only reference to Shakespeare in the litigation conducted by his parent about the property concerned … William, probably in respect of some right of inheritance, was a party to this, but the negotiation was apparently oral, and would not necessarily entail his presence at Stratford.[59]

There is little evidence that the negotiation was oral[60], and in any event, William Shakespeare's involvement appears to be concerned with references to writing. Also importantly, both parties to the dispute referred to "heirs and assigns" when the inheritance of property was at issue, whereas William Shakespeare is mainly linked to the submission of written documents. Also I believe Chambers has misread the nature of the dispute: John Shakespeare was not attempting to reclaim the land but was trying to extract extra money from John Lambert who had only recently inherited the property.[61] In effect, he was trying to cheat John Lambert out of £20, at a time when John Shakespeare appears to have been poverty stricken and looking for extra sources of income.[62]

Having his son helping with writing would have been invaluable to John Shakespeare. As Schoenbaum has written: 'From all the documentary evidence, John Shakespeare was not fully literate. Invariably the documents … [he] signed either with his mark or with a pictogram … The fully literate – even those who had become infirm or senile – tended to make a simple scrawl for their signatures rather than crosses.'[63]

There is evidence that William Shakespeare was very familiar with legal terminology. Fripp argued that he showed 'extraordinary knowledge, and large accurate usage, in his writings from the beginning, of legal terminology and procedure.'[64] The suggestion made by Malone – who was a barrister – that the dramatist spent some years as a lawyer's clerk, was also supported by other lawyers.[65] It is probable that Shakespeare acquired his legal knowledge working for his father in drafting legal documents in trading transactions.

Also, it makes it much more comprehensible as to how Shakespeare acquired the linguistic and cultural knowledge to write plays of such universal and general appeal. It has always puzzled historians how he acquired the knowledge to write such plays, but by participating in meetings in inns in London and elsewhere on trading expeditions, with a 'lengthy series of "speeches" and "communications" far into the night, and "smooth words, and fair speeches" ', helps to resolve this conundrum. Everitt makes it clear that these traders were highly cosmopolitan: 'the wayfaring community developed an ethos of its own dissimilar to that of the settled society of town and village. Its spirit of speculation and adventure ran counter to the stable traditions of the English peasantry.'[66] This culture provided Shakespeare with both the knowledge and background necessary for his theatrical and business career.

He would also have been exposed to theatres in London and elsewhere as he travelled around the country with his father. Inns were often centres of theatrical productions[67] and he

---

[59] E.K. Chambers, *William Shakespeare*, Volume 2 (1930), p. 37.
[60] John Shakespeare claimed that John Lambert had promised at Stratford to pay £20 for additional evidence for security of title to the Wilmcote property, to be paid in instalments at the manor house of Anthony Ingram in Little Walford. There is evidence that these meetings never took place, as the legal documents reveal that John Lambert already had security of title. See 'The Shakespeare/Lambert Dispute' in Razzell, *William Shakespeare* pp.35-45.
[61] Ibid.
[62] See pp. 16, 17.
[63] Schoenbaum, *Shakespeare's Lives,* 2006, p. 292.
[64] E. Fripp, *Shakespeare: Man and Artist*, Volume 1, page 138.
[65] Schoenbaum, *Shakespeare's Lives*, p. 332.
[66] Chartes, *Agricultural Markets*, p. 111.
[67] See Schoenbaum, *William Shakespeare*, p. 131; Michael. Wood, *In Search of Shakespeare*, 2005, p. 134. See the picture of Green Dragon Inn.

probably encountered them throughout the so-called 'lost years', preparing him for both his future work as a playwright and his career as an astute businessman. There is also evidence that Shakespeare may have encountered theatre companies directly during his working life with his father. Michael Wood has documented a case where wool-dealing and a theatrical production coincided in 1587:

'In mid-June 1587 … the Queen's Men were on tour in Oxfordshire, rolling their wagon of props and costumes into the wool town of Thame … at the time of the sheep clip in June the place was full of wool buyers and others; it was a good time to play, and it was visited by many travelling companies … There were inns for travellers at the east end … Here the Queen's Men played on 13 June … in the yard of an inn called the White Hand.'[68]

It is likely that Shakespeare encountered the Queen's Men in different inns as he and his father travelled the country on wool buying expeditions. Inns were widely used for theatrical productions during this period, and it was during sheep shearing in June and other times that travelling players gravitated to these locations to maximise revenue. As Keenan has written

Inns were important as staging places 'for the multitude of carriers'; growing numbers of merchants and traders held meetings and made bargains at inns … To play at inns was to perform in one of the spaces at 'the heart of the social world' of most early modern English communities … At the same time, local and visiting inn customers provided a ready and potentially generous audience, most inn customers being drawn 'from the landed, mercantile and professional classes.'[69]

This explains why theatrical companies were so keen to locate their travelling productions during sheep fairs and times of wool shearing, such as that at Thame. Shakespeare probably encountered The Queen's Men in inns and other venues, which might explain why four of the company's plays were forerunners to Shakespeare's later writing. According to Pauline Montague, these plays were '*The Troublesome Regn of King John*, *The True Tragedy of Richard III*, *The Famous Victories of Henery V*, *The True Chronicle History of King Leir and his three daughters, Gonorill, Ragan and Cordelia*.' She concluded that 'these plays … are actually among the repertoire of the Queen's Men and Shakespeare's own plays show such an intimate knowledge of these and other of their repertoire, in some cases even before they were published, that several biographers believe that Shakespeare may have been a member of the Queen's Men early in his career.' [70]

The Earl of Southampton and the Gift of £1000.

Rowe wrote:

He [Shakespeare] had the Honour to meet with many great and uncommon Marks of Favour and Friendship from the Earl of Southampton … There is one Instance so singular in the Magnificence of this Patron of Shakespear's, that if I had not been assur'd that the Story was handed down by Sir William D'Avenant, who was probably very well acquainted with his Affairs, I should not have ventur'd to have inserted, that my Lord Southampton, at one time, gave him a thousand Pounds, to enable him to go through with a Purchase, which he heard he had a mind to.[71]

---

[68] Michael Wood, *In Search of Shakespeare*, 2005, p. 112. See also p. 143 for a picture of such a provincial inn.
[69] Siobhan Keenan, *Provincial Playing Places and Performances in Early Modern England, D.Phil.,* University of Warwick, 1999, p. 434.
[70] Pauline Montagna, 'William Shakespeare and the Queen's Men', *Shakespeare and His World/The Elizabethan Theatre*, 2002 Online.
[71] Nicholl, *The Life*, pp. 37, 38.

It was this claim that Malone objected to: 'that Lord Southampton gave him a thousand pounds … in order that he might complete a purchase, is totally unworthy of credit, since no such extensive purchase ever appears to have been made by him [Shakespeare], as will be seen when we come to make an estimate of the property which he possessed.'[72] There is however an independent source for this story: R.B. Wheeler in his *History and Antiquities of Stratford-Upon-Avon*, published in 1806, informs us that 'the unanimous tradition of this neighbourhood is that by the uncommon bounty of the Earl of Southampton, he [Shakespeare] was enabled to purchase houses and land in Stratford.'[73]

Shakespeare makes a number of references to a thousand pounds relating to Falstaff in *Henry IV*: 'He said this other day, You [the Prince] ought him a thousand pound', and when challenged about his cowardice, Falstaff tells the prince that 'I would give a thousand pound I could run as fast as thou canst … here be four of us, have taken a thousand pound this morning.' Falstaff asks the Lord Chief Justice: 'Will your Lordship lend me a thousand pound, to furnish me forth; and eventually he persuades the gullible Shallow to lend him a thousand pounds in anticipation of the fruits of Prince Hal's succession to the throne.[74]

A more objective source of evidence is provided by the financial expert David Fallow, who has examined in his doctoral thesis Shakespeare's financial activities. He has listed all the financial investments that Shakespeare made as follows:

Major Shakespeare Investment 1597-1610.[75]

Year	**£**	**Investment**
1597	50	Sharer
1599	60	New Place
	40	Title
1602	60	Housekeeper
1605	320	Land
1605	440	Tithes
1610	300	Land
1613	140	Gatehouse
	60	Globe Rebuild
Total	**1470**	

Fallow also examined the source of Shakespeare's income from his theatrical work and other sources:

Shakespeare almost uniquely had multiple strands of theatrical income: playwriting, membership of The King's Men, and as a part-shareholder in the Globe theatre itself. However, careful financial analysis reveals that his total possible earnings from even these investments fall far short of his known wealth …Moreover, timing is also crucial as several key investments in land and property were made *before* theatrical income could have supplied the cash. Between 1597 and 1605 he purchased almost £1000 of investment in and around Stratford-upon-Avon … Playing companies such as The King's Men bought plays outright, paying around £6 for each work … Shakespeare's averages two plays per year adding another £20 to his income.'[76] 'A net £60 per annum would have supported a comfortable, but not

[72] Malone, *The Plays,* pp. 69, 480.
[73] R.B. Wheeler, *History and Antiquities of Stratford-Upon-Avon*, 1806, p. 73.
[74] Razzell, *William Shakespeare*, p. 50.
[75] D. Fallow, *John and William Shakespeare: The Sources and Acquisition of their Wealth,* D.Phil. Thesis, 2011, Volume 1, p. 96.
[76] D. Fallow, 'Where Did Shakespeare's Money Come From', Online.

extravagant, lifestyle but it would not, by any stretch of the imagination, paid for the stream of investment he made between 1597 and 1613.[77]

Given that he did not earn the money for his investments from his theatrical work, this suggests that he must have had alternative sources of income, including gifts from the Earl of Southampton. As we have seen in addition to the thousand pounds, Rowe wrote that Shakespeare met 'with many great and uncommon Marks of Favour and Friendship from the Earl of Southampton', which could have included much more modest sums of money. Also, Wheeler refers to 'uncommon bounty of the Earl of Southampton', without mentioning any specific sum.

Both Shakespeare's verse poems *Venus and Adonis* and *The Rape of Lucrece* were dedicated to the Earl of Southampton. As Schoenbaum has claimed, 'many commentators, perhaps a majority, believe that the Earl is the Fair Youth urged to marry and propagate in the *Sonnets*.[78] According to one account, 'the young Earl was reckless with his money and he had no head for the business of managing his land. But Southampton didn't care. With an income of £11,000 a year, he had more money than he would ever need, and the disapproval of the relatives, whom he hardly knew, and his guardian, meant nothing to him.'[79]

He fell out with his guardian Lord Burghley, who had wanted him to marry Burghley's grand-daughter, but Southampton refused and Burghley used his power as Master of the Wards to fine him £5,000, which indicates the scale of Southampton's wealth.[80] Southampton was highly attracted to the theatre and in a letter dated at the end of 1599, it was stated that he failed to go to court but passed 'away the time in London *merely in going to plays every day*.'[81]

Given the evidence of the intimate relationship between Shakespeare and Southampton, and the latter's wealth and spendthrift nature, it is feasible that he did give Shakespeare a thousand pounds and other gifts. It explains how Shakespeare managed to purchase investments between 1597 and 1605, totalling a thousand pounds, and contradicting Malone's claim that there was no evidence that Shakespeare purchased property on this scale.

The Poaching of Deer and Exile.

Included in Rowe's biography was an account of how Shakespeare was forced to leave the work with his father, as a result of the poaching of deer from Sir Thomas Lucy's park:

> Upon his leaving School, he seems to have given intirely that way of Living which his Father propos'd to him … In this kind of Settlement he continu'd for some time, till an Extravagance that he was guilty of, forc'd him both out of his Country and that way of Living which he had taken up … He had, by a Misfortunate common enough to young Fellows, fallen into ill Company; and amongst them, some that made a frequent practice of Deer-stealing, engag'd him with them more than once in robbing a Park that belong'd to Sir Thomas Lucy of Cherlecot, near Stratford. For this he was prosecuted by that Gentleman, as he thought, somewhat too severely; and in order to revenge that ill Usage, he made a Ballad upon him … it is said to have been so very bitter, that it redoubled the Prosecution against him to that degree, that he was oblig'd to leave his Business and Family in Warwickshire, for some time, and shelter himself in London.[82]

---

[77] Fallow, *John and William* Shakespeare, p. 96.
[78] Schoenbaum, *William Shakespeare,* p. 179.
[79] *William Shakespeare and the Earl of Southampton* [Online].
[80] Ibid.
[81] Malone, *The Plays*, p. 477.
[82] Nicholl, *The Life,* pp. 28, 29.

The essential story of poaching, capture, prosecution, and flight has survived in at least three separate versions – those of Davies, Rowe, and Jones.[83] They were independent of each other and unaware of alternative accounts. According to Davies, Shakespeare 'was much given to all unluckiness, in stealing *venison* and *rabbits*; particularly from Sir Lucy … who had him *oft whipt,* and sometimes *imprisoned*, and at last made him fly his native country, to his great advancement.'[84]

Another account was by Thomas Jones, who lived in Tarbick, a village a few miles from Stratford. He died in 1703 aged upwards of ninety and remembered 'to have heard from several old people at Stratford the story of Shakespeare's robbing sir Thomas Lucy's park; and their account of it agreed with Mr. Rowe's, with this addition – that the ballad stuck upon his park gate, which exasperated the knight to apply to a lawyer at Warwick to proceed against him.'[85]

The ballad reputedly included the following:

A parliement member, a justice of peace,
At home a poore scarecrowe, in London an asse …
He thinks himself greate, yet an asse in hys state
We allowe bye his eares but with asses to mate …
He's a haughty proud insolent knighte of the shire
At home nobodye loves, yet theres many hym feare …
To the sessions he went and dyd sorely complain
His parke had been rob'd and his deer they were slain …
He sayd twas a ryot his men had been beat,
His venson was stole and clandestinely eat …
Soe haughty was he when the fact was confess'd
He sayd twas a crime that could not be redress'd …
Though Lucies a dozen he paints in his coat …
If a juvenile frolick he cannot forgive
We'll synge Lowsie Lucy as long as we live.[86]

This version of the poaching incident adds details of the beating of the park keepers and the "Lucies" on Sir Thomas Lucy's coat of arms. The assumption of Rowe's version of the poaching incident is that it occurred at Charlecote, the manor house of Sir Thomas Lucy. But in the later eighteenth century claims were made that it took place at Fulbrook Park, two miles distant from Charlecote.[87] The poaching incident was used by Shakespeare in the autobiographical play *The Merry Wives of Windsor.* He made Falstaff among other things a deer stealer, and satirized Sir Thomas Lucy as Justice Shallow.[88]

The multiplicity of separate sources for the poaching story would in itself suggest that it was genuine. Sir Thomas Lucy was a Member of Parliament and in March 1585 had charge of a bill 'for the preservation for grain and game'. The association between Justice Shallow and Lucy is suggested by their similar coat of arms. Shallow had 'a dozen white Luces', whereas Sir Thomas had three white luces – although on at least one occasion his coat is known to have been "quartered", reminiscent of Slender's remark on Shallow's coat: 'I may quarter (Coz)', producing a dozen white luces.' Most scholars have been prepared to accept that the traditional testimony for the poaching story is strong, but the major difficulty in its acceptance has been

[83] Schoenbaum, *William Shakespeare*, p. 103.
[84] Malone, *The Plays*, p. 123.
[85] Schoenbaum, *William Shakespeare*, p. 102.
[86] Malone, *The Plays,* p. 565.
[87] Ibid, p. 87; Schoenbaum, *William Shakespeare*, pp. 104, 105; Razzell, *William Shakespeare*, pp. 86, 87.
[88] Razzell, *William Shakespeare*, p. 89, pp. 98, 99.

until now the absence of any firm evidence for a deer park at Charlecote or Fulbrook at the relevant period.[89]

Malone was very sceptical about the authenticity of the poaching incident:

> Sir Thomas Lucy could not lose that of which he never was possessed; that from him who is not master of any deer, no deer could be stolen. It is agreed, that there never was a park at Charlecote; and, if the knight never eat any venison but what came out of the park of Fulbroke, he certainly never partook of that delicacy; for he never was possessed of Fulbroke, nor was it enclosed in his time; having been disparked before he arrived at the age of manhood, in which state it continued during the whole of his life.[90]

In fact Malone was wrong about both Charlecote and Fulbrook parks.[91] The Sheldon Tapestry Map bearing the date 1588 – the approximate date of the poaching incident – shows a paling attached to Charlecote, bounded on one side by the river Avon.[92] As Croom has observed of such a habitat: 'Where the local topography allowed, natural boundaries such as a river or marshy ground might circumscribe the park.'[93] Bracebridge in his book about Shakespeare and his deer-stealing activities, written in 1862, tells us that 'Sir Thomas Lucy, who in 1558 rebuilt the manor house of Charlecote as it now stands, imparked a considerable tract around it, on the left bank of the Avon in 1563 … [which] ran along the bank of the Avon for nearly a mile.' This description fits perfectly with the Sheldon map – the Charlecote paling is shown ending just opposite Wasperton.[94]

There was a cony warren licenced at Charlecote owned by Sir Thomas Lucy. In the final quarter of 1584 a second 'cony keeper' was added to the list in the Charlecote Household Accounts Book. The pattern of two keepers was maintained right through to the end of the record in 1587.[95] Schoenbaum has clarified the position of deer at Charlecote: 'If fallow deer would not come under the heading of beasts of warren, roe deer would. So the episode could have taken place at Charlecote after all.'[96]

---

[89] Ibid, p. 89.
[90] Malone, *The Plays*, pp. 145, 146.
[91] For a full discussion of the poaching incident see Razzell, *William Shakespeare,* pp. 85-120.
[92] In the Victoria and Albert Museum.
[93] Razzell, *William Shakespeare*, p. 114.
[94] Ibid, p. 112.
[95] Ibid, p. 93.
[96] Schoenbaum, *Shakespeare's Lives*, p. 71.

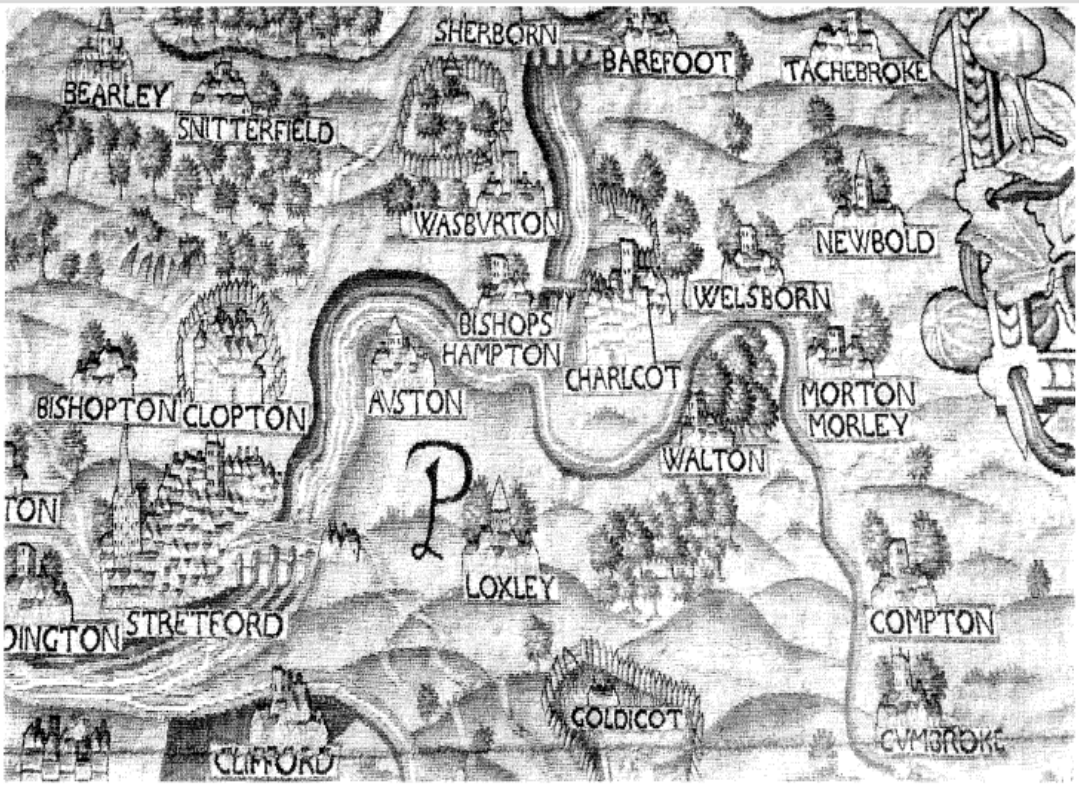

Plate 3: Charlecote and Surrounding Area (From Sheldon Tapestry Map of Worcestershire in The Victoria and Albert Museum)

There appears to be a park at "Wasburton" just east of Snitterfield, which is completely surrounded by palings. There is no sign of Fulbrook, but in fact what has happened is that the tapestry weavers took the location of Wasperton [Wasburton] from Saxton's 1576 map of Warwickshire. Saxton's map had such authority with contemporaries that the Sheldon mapmakers preferred to believe Saxton rather than the evidence of their own eyes. If Wasperton is relocated in its correct position on the right side of the river, a park emerges exactly where Fulbrook was located. The Warwick to Stratford road runs alongside its paling, as described by Rous,[97] and it is precisely where it should be located according to various descriptions. In particular Leland's account: 'I roade from Warwicke to Bareford Bridge … 2 miles [from Warwick]. Here I sawe halfe a mile lower upon Avon on the right ripe by northe a fayr parke caulled Fulbroke.'[98]

Land at Fulbrook was licenced to Sir Thomas in 1573. The following entry was entered in the Calendar of Patent Rolls for 27 April 1573: 'Licence for Edward Graunt to alienate lands in Fulbroke, co. Warwick, to Thomas Lucy, Knight, John Somervyle and Henry Rogers …' [99] This licence reads:

The Queen … granted and gave licence … to our beloved Edward Grant … [of] one message, twenty acres of land, forty acres of meadow, three hundred acres of pasture and ten acres of woodland, with appurtenances in Fulbrook … so that he can give and grant, alienate … to beloved and faithful Thomas Lucy Knight and our beloved John Somerville, Esquire and Henry Rogers, Gentleman …'[100]

[97] Razzell, *William Shakespeare*, p. 97.
[98] Ibid, p. 106, 112.
[99] Ibid, p. 100.
[100] Ibid.

Henry Rogers was a lawyer and not only was he Sir Thomas Lucy's steward but he was listed in Lucy's account book for the year 1580 as 'ffyrst retayner'; he was also town clerk and steward to the Stratford Corporation for the period 1570-86, covering John Shakespeare's time in high office.[101]

Fulbrook had expanded from one acre of woodland in June 1573 to 100 acres of woods in October 1573, and the area in question was designated as Fulbrook Park.[102] It is possible that this when it was again created as a hunting park, with protective paling. Fulbrook was only a mile or so away from Snitterfield, depicted in the Sheldon Tapestry Map. Snitterfield was the residence of Shakespeare's uncle Henry Shakespeare and the birthplace of his father, and an obvious location for poaching activities.

Malone wrote extensively about the legislation covering the punishment for poaching activities, and he claimed that nowhere did it list that the poaching deer carried out by Shakespeare should be punished severely.[103] This does not account for the effect of the ballad Shakespeare wrote satirizing Sir Thomas. According to Rowe the ballad 'is said to have been so very bitter, that it redoubled the Prosecution against him.'[104] This is confirmed by Jones: 'the ballad … stuck upon his park gate, which exasperated the knight to apply to a lawyer at Warwick to proceed against him.'[105]

Additionally, justices of the peace often used their authority to go beyond the formalities of the law: Lambard complained in 1582 'that justices of the peace … arrogate unto themselves authority to use their discretion, and to play, as it were, the Chancellor in every cause that cometh before them.'[106] Sir Robert Cecil was even more specific in a letter he wrote in 1600: 'for my deare that are killed, what I can do by law I will prove, but otherwise I will reveng myself by no other meanes under color of authority being in myne owne case.'[107]

That whipping was seen by contemporaries as a minor form of punishment, is indicated by one author's observation of the effects of free-school education: 'I must needs come short of their experience that are bred up in free-schools, who, by plotting to rob an orchard, etc, run … under no higher penalty than a whipping.'[108]

All the ingredients of the poaching tradition are to be found in the historical record: two areas of enclosed parkland, a deer park (Fulbrook) and cony warren (Charlecote), a gatehouse, estate gamekeepers, the presence of both deer and rabbit in at least one of Sir Thomas Lucy's parks.

The poaching incident may be linked to a period of poverty that John Shakespeare was experiencing during this time. In 1578 he was allowed by Stratford Corporation to pay a reduced contribution for the maintenance of the local militia. Additionally in the same year, he was exempted from contributing towards the weekly maintenance of the poor.[109] He was undergoing 'years of adversity'[110], culminating in 1592 when he avoided church because of a 'feare of process for debte'.[111] The poaching incident probably occurred in about 1588 and may have been responsible for Shakespeare leaving Stratford. Poaching was not then just a youthful frolic but was linked to a period of poverty and economic hardship.

---

[101] Ibid, pp. 101, 102.
[102] Ibid, p. 103.
[103] Malone, *The Plays*, pp.119-147.
[104] Nicholl, *The Life*, p. 29.
[105] Schoenbaum, *William Shakespeare*, p. 102.
[106] Razzell, *William Shakespeare*, p. 120.
[107] Ibid.
[108] Ibid.
[109] Lewis, *The Shakespeare Documents,* pp. 65-67.
[110] F.E. Halliday *A Shakespeare Companion,*1964, pp. 441- 42.
[111] Ibid.

Conclusion: Banishment and Resolution of Exile.

It appears that the Shakespeare's banishment as a result of the poaching incident had a profound effect on him. In all, there are mentions of deer hunting and cony catching in eighteen of Shakespeare's plays and two in his narrative poems.[112] And there is an expression in Sonnet 29 of his bitterness at being exiled from his home and family.[113]

When in disgrace with Fortune and men's eyes
I all alone beweep my outcaste state,
And trouble deaf heaven with my bootless cries,
And look upon myself and curse my fate.

However, he appears to have come to terms with his exile through his writing as a playwright, for as Rowe tells us: 'The latter Part of his Life was spent, as all Men of good Sense will wish theirs may be, in Ease, Retirement, and Conversation of his Friends',[114] reflected perhaps in the following passage from *As You Like It*:

Sweet are the uses of adversity, which like a toad, ugly and venomous, wears yet a precious jewel in his head. And this our life, exempt from public haunt, finds tongues in trees, books in running brooks, sermons in stones, and good in everything.

[112] Ibid, p. 121.
[113] William Shakespeare, *The Oxford Shakespeare: The Complete Sonnets and Poems*, 2002.
[114] Nicholl, *William Shakespeare*, p. 72.

The Potential Danger of Monkey Pox Virus.

Galina and Sergei Shechelkunov in their review of orthopoxvirus infections have described the world-wide spread of monkey pox and the danger this has presented as a result of a possible emergence of new forms of smallpox.[1] They have concluded that 'an increasing number of human infections with zoonotic orthopoxviruses and, first of all, monkeypox, force us to reconsider a possible re-emergence of smallpox or a similar disease as a result of natural evolution of these viruses.'[2]

They go on to add that 'human monkeypox is of particular concern. In conditions of a long absence of vaccination of the population and a much more frequent infection in people, MPXV [monkeypox] can acquire not only high transmissibility but also high pathogenicity, which is characteristic of VARV [smallpox], as a result of natural evolution.'[3]

There is reason to believe that a similar process of evolution occurred historically with an increase in the virulence of smallpox. Additionally, there is other historical evidence that monkeypox, cowpox and smallpox were sometimes very closely related. At the end of the nineteenth century the microbiologist, S.M. Copeman, explored the relationship between smallpox and cowpox experimentally:

> He first inoculated a monkey with smallpox virus and then inoculated a calf from such an infected monkey. This resulted in typical vaccine, from which good strains of vaccine lymph were obtained. On the basis of this experience, Copeman suggested that cowpox may have actually originated in the eighteenth century from inoculated smallpox, as the local sore produces by the inoculation incision frequently was very itchy, and milkers who scratched their arms may easily have conveyed infectious matter to the cow's udder.[4]

Copeman gave further details of his experiments in the *Proceedings of the Royal Society of London* as follows:

> I next turned to the monkey tribe on account of their similarity in many respects to man …the inoculation of vaccine and of variolous lymph having each of them in my hands, successful results in every instance in which I have tried it on the monkey.[5]

Other authorities have also linked monkeypox with smallpox: 'previously the MPX [monkeypox] was reported to be like smallpox infection with less fatality. However, over time, the MPX virus became more pathogenic and caused an outbreak with lots of unanswered

[1] Galina and Sergei Shechelkunov, 'Smallpox, Monkeypox and Other Orthopoxvirus Infections', MDPI AG.
[2] Ibid.
[3] Ibid.
[4] P. E Razzell, 'Edward Jenner: The history of a medical myth', *Medical History,* 1965, p. 222.
[5] *Proceedings of the Royal Society of London,* Abstract, 1894.

questions.'[6] This implies that monkeypox and smallpox are very closely related, although genetic analysis shows that they are distinct viruses,[7]

Historically, smallpox has also been confused with cowpox, and there were many successful attempts to convert the former into the latter, mainly for the purposes of the production of vaccine.[8] However, many of the developments are controversial, and genetic analysis of the three viruses – smallpox, cowpox and vaccinia – have shown them to be genetically distinct.[9] Nevertheless there is good evidence that the early smallpox vaccines, including that promoted by Jenner, were forms of attenuated smallpox.[10] The source of Woodville's 'World Lymph' was taken from the arm of a patient with over 300 pustules, and this was used by Jenner in his early practice.[11] Jenner himself acknowledged the variolous nature of this vaccine, by writing 'I made some experiments myself with this matter, and saw a few pustules on my first patients, but in my subsequent inoculations [vaccinations] there were none.[i12]

The source of the Lister Institute's stock of vaccine is believed to be from the arm of Prussian soldier suffering from smallpox in 1870, [13] and there is now extensive evidence that much smallpox vaccine is derived from smallpox itself.[14]

This raises the question of the relationship between the smallpox, cowpox and vaccinia viruses, but as we have seen genetic analysis reveals all three viruses to be distinct. The solution to this conundrum probably relies on the evolution of all viruses, involving a rapid rate of mutations.[15] For example, this would possibly explain how the COVID pandemic started in Wuhan market animals.'[16] This might account for how smallpox virulence increased markedly in England between the sixteenth and nineteenth centuries.

We saw earlier how monkeypox 'became more pathogenic' over time and this is mirrored in the history of smallpox infection. The following table depicts the increasing mortality rate of smallpox in London between the sixteenth and eighteenth century.[17]

---

[6] Avsel Karagoz, Husevin Tombuloglu, Moneerah Alsaeed, Guzin Tombuloglu, Abdullah A. AlRubaish, Amal Mahmoud, Samira Smallovic, Sabahudin Cordic, Ali A. Rabaan and Ebledam Alsuhaim, Monkeypox [mpox] virus: Classification, origin, transmission, genome organization, antiviral drugs, and molecular diagnosis', *Journal of Infectious Public Health,* 2023 [Online].
[7] Ibid.
[8] P.E. Razzell, *Edward Jenner's Cowpox Vaccine: The History of a Medical Myth*. 1980, p. 98.
[9] A. W. Downie, 'Smallpox', in S. Mudd, (ed.), *Infectious Agents and Host Reactions,* 1970.
[10] See Razzell, *Edward Jenner's Cowpox Vaccine*.
[11] Ibid, pp. 22-26.
[12] J. Barron, *Life of Dr Edward Jenner*, 1827, Volume 1, pp. 314,342.
[13] J.A. Dudgeon, 'Development of smallpox vaccine in England in the eighteenth and nineteenth centuries', *British Medical Journal*, 1963, p. 1371.
[14] Razzell, *Edawrd Jenner's Cowpox Vaccine*, p. 98.
[15] Karagoz et.al., 'Monkey pox [mpox] virus',.
[16] S. Mallapaty, 'COVID pandemic started in Wuhan market animals', *Nature*, 20th September 2024.
[17] These figures are taken from P.E. Razzell, *The Conquest of Smallpox*, 2003.p. 169; C. Creighton, *A History of Epidemics in Britain*, Volume 2, 1965, p. 531.

- **Table 1: Smallpox Deaths in the London Bills of Mortality**

Period	*Proportion Smallpox Burials*
1574-98	1.60%
1629-36	2.80%
1650-60	4.80%
1660-70	3.60%
1670-80	7.10%
1680-90	7.30%
1690-1700	4.50%
1700-10	5.30%
1710-20	8.10%
1720-30	8.20%
1730-40	8.50%
1740-50	7.30%
1751-60	9.60%

The increase in virulence during the middle of the seventeenth cent is reflected in contemporary comments. For example, Dr Tobias Whitaker, who had been exiled with Charles II during the civil war, wrote in 1661 that the smallpox

> Was constantly and generally in the common place of petit and puerile and the cure of no moment… But from what present constitution of ague this childish disease hath received such pestilential tinctures I know not; yet I am sure that this disease, which for hundreds of years and before the practice of medicine, was so exquisite, hath been as commonly cured as it hapned.[18]

Other commentators writing in the 1660s noticed this increase in virulence.[19] The increasing fatality of smallpox is revealed in the case fatality rate of the disease in the London Smallpox Hospital.

Table 2 ; Case Fatality Rate of Smallpox in the London Smallpox Hospital.[20]

Period	*Number of Cases*	*Proportion That Died*
1746-63	6456	26%
1776-1800	7017	32%
1836-51	2654	38%

This table covers the period between the middle of the eighteen and nineteenth centuries, and Lettsom writing in 1795 stated:

[18] Creighton, *A History*, Volume 2, p. 436.
[19] G. Miller, *The Adoption of Inoculation for Smallpox in England and France*. 1957. p. 30.
[20] *Royal Commission on Vaccination*,1st Report, 1889, p.74; 3rd Report, 1890, p. 100; 6th Report, 1896, p.717; *The Lancet*, Volume 9, 1826, pp 670, 671.

I think from my own experience, that the malignity [of smallpox] even in London is augmenting. When I practised here, 35 years ago, one in ten was the calculation; but I think one in six is now a fair proportion.[21]

There is evidence that the disease continued to increase in virulence throughout the nineteenth century:

Table 3: Case Fatality Amongst the Unvaccinated in Smallpox Epidemics 1781-1893.[22]

Location of the Epidemic	*Date*	*Cases*	*Deaths*	*Per Cent Fatality*
Leeds	1781	462	130	28%
Huddersfield	1783	458	103	22.5%
Norwich	1819	200	46	23%
Sheffield	1887-88	552	274	49.5%
Dewsbury	1891-92	366	92	25%
Warrington	1892-93	68	24	35.5%
Leicester	1892-93	158	19	12%
London	1892-93	409	199	48.5%
Gloucester	1892-93	768	314	41%

McVail concluded that 'natural smallpox gradually became throughout the eighteen century, and up to the epidemic of 1870-73, a more virulent and fatal disease, its maximum fatality being on a large basis of facts 45 per cent.'[23]

It was only the practice of variolation and vaccination that prevented England from being devastated, similar to what occurred in the fourteenth century as a result of the bubonic plague. Fortunately, it appears smallpox vaccine is effective in preventing monkeypox,[24] although this may require the development of a vaccine designed specifically for monkeypox. This may also require similar measures conducted in England in the nineteenth century, including the introduction of compulsory vaccination in 1840.[25]

Although hypothetical, the risks of a development of a major monkeypox epidemic are sufficiently serious to require preventive action. As we saw earlier the fatality of monkey pox is increasing with a case fatality rate of up to ten per cent.[26] If like smallpox, in its spread and fatality continues to increase, it will be necessary to take major preventative action.

[21] T.J. Pettigrew, *Memoirs of the Life and Writings of the Late John Oakley Lettsom,* 2, 1817, pp. 121, 122.
[22] Razzell, *The Conquest*, p. 177.
[23] J.C. McVail, *Half a Century of Smallpox and Vaccination,* 1919, p. 19.
[24] Karagoz et.al., 'Monkey pox [mpox] virus'.
[25] Creighton, *A History*, Volume 2, p.610.
[26] Karagoz et.al., 'Monkeypox [mpox] virus'.

The Origins of the Long Parliament in the English Civil War.

There has been much debate about the origins of the Long Parliament during the English Civil War. What has not been sufficiently realised is the importance of the nature of parliamentary constituencies and the way they affected the nature of Members of Parliament.

In 1603 there were 462 Members of the Commons, 90 of which were knights of the shire and 372 burgesses [town representatives] from the boroughs.[1] These boroughs were dominated by corporations which are known to have been strongly associated with puritanism. For example, a Durham cleric urged the king in 1640 not to 'suffer little towns to grow big and anti-monarchy to boot, for where are all these pestilent nests of Puritans hatched, but in corporations.'[2] Consistent with this statement was Clarendon's conclusion that the chief opposition to the king lay in 'great towns and corporations … not only the citizens of London … but also the greatest part of all other cities and market towns of England.'[3]

Contemporaries were unanimous that the inhabitants of the towns of England were the chief supporters of parliament during the civil war, and that tradesmen were some of their most ardent supporters. For example, this was the conclusion of Parker in his *Discourse of Ecclesiastical Politie.* He wrote that

> 'tis notorious that there is not any sort of people so inclinable to seditious practices as the trading part of a nation … And, if we reflect upon our late miserable distraction, tis easy to observe how the quarrel was chiefly hatched in the shop of tradesmen and cherished by the zeal of prentice-boys and city gossips.'[4]

Baxter claimed that tradesmen explained their support for Parliament 'because they say the Tradesmen have a Correspondency with London, and so are gown to be more intelligent sort of Men.'[5] He also claimed that religious awareness was particularly strong 'among tradesmen and corporation inhabitants.'[6]

Given the importance of borough constituencies in the electoral process, and their links with puritanism, Pym's tour of these constituencies in 1640 involving the promotion of puritanism, becomes significant.[7] Cromwell's appointment as Member of Parliament for Cambridge at this time can be seen as a result of this process. He at this time was only of a modest status as a local farmer[8], but appears to have been nominated by puritans on the local Cambridge council.[9]

The role of corporations in the membership of the Long Parliament is confirmed by events after the ending of the civil war. In 1661, the Cavalier Parliament passed the Corporation Act, designed to exclude Presbyterians from office, and stipulating that 'no person could legally be elected to any office relating to the government of a city or corporation, unless he had within

---

[1] UK Parliament Online.
[2] Derek Hirst, *The Representative of the People? – Voters and Voting in England under the Early Stuarts*, 1975, p. 47.
[3] Edward Hyde, *The History of the Rebellion*, Volume 2, 1888, pp. 236, 238.
[4] C. Hill and E. Dell (eds), *The Good Old Cause: The English Revolution of 1640-1660, Its Cause, Course and Consequences,* 1969, p. 238.
[5] R. Baxter, *Reliquiare Baxterianae*, Part 3, 1696, p. 30.
[6] Ibid, p. 27.
[7] Hirst, *The Representative,* p. 147.
[8] John Morrill, *Oliver Cromwell and the English Revolution*, 1990, p. 22.
[9] Personal correspondence from the Cromwell Museum.

the previous twelve months received the sacrament of the "Lord's Supper" according to the rites of the Church of England.'[10]

This confirms the importance of boroughs and corporations in the Parliamentary cause, a topic which can only explored further when the *Parliament of England* completes its website for the period 1640-1660.

[10] *Corporation Act 1661*, Wikipedia.